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# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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## Product Spotlight

### The Portables: Traveling Quickly

By Jim Bartino  
CW Staff

It is a testament to the exponential speed with which computer technology is moving that it took 30 years to shrink a room-size computer to desktop size, but less than five years to shrink a desktop computer to the size of a briefcase.

The move to miniaturization is continuing with portable computers, which today are offered in a variety of sizes small, medium and large. The large ones — "transportables" — are 20- to 30-pound, full-function micros. The medium and small ones — "portables" — usually weigh 12 pounds or less and have fewer capabilities than a desktop. There are also extra-small, hand-held systems with one-line displays, but their applications are limited.)

Just how seriously should the transportable market be taken? At the end of this year, some 410,000 transportables will have been sold, according to Future Computing, Inc. Moreover, the Richardson, Texas, market research firm estimates that this market will grow from \$12.3 billion in 1984 to \$27.6 billion in 1987.

Because the suitcase-size transportables weigh in at a back-breaking 20 to 30 pounds, many users are not, in fact, buying them with long-distance travel in mind. According to John Hemphill, senior technology consultant for Future Computing and an expert on portables, much of the travel that these computers do is within the office. For example, a company that does not need a machine on every desk can "divide" one among four managers.

Ellen Levin, product manager for International Data Corp. in Framingham, Mass., agreed that transportables are "too heavy to take back and forth to the home and office." But, she noted, a service organization, such as Big Eight accounting firm could hand them out for computing at the client's office for weeks at a time.

While transportables' weight may be too much, their size is just right. "The small footprint is a big factor," explained Kenneth

(Continued on Page 10)

Shown from top to bottom are a suitcase-size transportable (TeleVideo Systems, Inc.'s Teletote II); a briefcase-size portable (Grid Systems Corp.'s Compass); and a notebook-size portable (NEC Home Electronics USA's PC-6201).

## One-Vendor Users Groups Denied Tax-Exempt Status

By Tom Henkel

CW Staff  
WASHINGTON, D.C. — The Internal Revenue Service has pulled the rug out from under computer users groups with a ruling that denies tax-exempt status to user organizations dedicated to one vendor's products.

The Oct. 31 ruling applies to organizations seeking tax exemption as a "business league" or a group of people with a common business interest. In most cases, users groups are primarily comprised of users of a specific vendor's hardware. But even if the organization allows nonusers to join its ranks, the users group cannot qualify for the exempt status unless the forum is open to competing vendors, an IRS spokesman said.

The IRS made its decision, a tightening of a similar 1974 ruling, on the reasoning that a vendor's product line is only a segment of the total computer marketplace. A group of users devoted to solving problems and improving that product line, therefore, provides a service for the vendor and puts other vendors at a competitive disadvantage, the IRS spokesman explained.

The ruling caught administrators of most users groups by surprise. Several expressed concern that the ruling could cause financial

problems for their organizations, but most were confused over exactly how the IRS plans to enforce the ruling. Several users group spokesmen said they wanted to see the actual IRS ruling before commenting on its impact.

The issue raised by the IRS centers on whether users groups can exclude makers of different or competing products from their meetings. The National Prime (Computer, Inc.) User Group, for example, does not allow

vendors marketing Prime-compatible hardware and software to display products or make presentations at its meetings, according to the organization's president, Bill Lennhardt. IBM users groups, such as Guide and Common, have similar policies.

But other users groups, such as the Eastern Region Prime User's Group (a regional subsidiary of PUG), open their meetings to vendors of competing products. According to PUG-East President (Continued on Page 8)

## Communications Processor Announced by Tandem

By Jeffrey Beeler

CW West Coast Bureau  
CUPERTINO, Calif. — Tandem Computers, Inc., today expanded the communications capabilities of its product line with an enhanced front-end processor that reportedly outperforms its Tandem predecessors by 20% to 40% and gives users increased flexibility in configuring their networks.

The Model 6100 integrates into a single package all of the communications features found in the firm's previous systems, a Tandem spokesman said. However, the early models — the 6303, 6202 and 6204 — will continue to be sold and supported.

A beta test site for Tandem's first 32-bit processor, the newly introduced TX2, confirmed the vendor's performance claims. Story on Page 3.

Like the rest of Tandem's fault-tolerant Non-Stop product line, the 6100 is aimed primarily at on-line transaction processing environments, requiring large numbers of terminals for applications such as automated banking, point-of-sale and shop-floor control.

The Model 6100 front-end controller is said to accommodate simultaneously up to 900 terminals. (Continued on Page 8)

## Inside

First users of Viewtron, America's first commercial videotex service, are happy with what they see. But the technology's true screen test lies in the future. Page 2.

Apple Computer, Inc. will introduce "major new products" early next year, its president said last week as he warned Wall Street analysts that earnings will remain down through next spring. Page 4.

The research relationship between IBM and Josephson junction technology has cooled, raising to three the number of major firms that have put supercooling on the back burner. Page 5.

IMS or IDMS? When the John Hancock Mutual Life Insurance Co. had to choose between those data base management systems, it used a performance man-

agement utility to help determine models of the two. Page 13.

Mobil Oil Corp. has given a little gas to the movement toward a national electronic payment system. It has become the first to announce plans for a network that would allow consumers around the nation to use bank debit cards for retail purchases. Page 103.

Yet another IBM-compatible communication gateway has been announced. A back-end processor from Flexus Computers, Inc. lets users of IBM microcomputers access data in Flexus supermini-computers. Page 117.

An export administration bill has been approved by the House of Representatives. Page 151.



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# Apple Says Earnings Will Remain Depressed

By Peter Bartolick  
CW Staff

NEW YORK — Apple Computer, Inc.'s chief executive last week warned Wall Street analysts that increased expenditures on new products will keep the company's earnings through next spring at the depressed levels reported Sept. 30.

"Major new products" will be announced early next year, including a 32-bit microprocessor, John Sculley, Apple's president and chief executive officer, told a gathering of analysts here. That microprocessor is universally believed to be the rumored Macintosh.

Two analysts with differing views of Apple's strategy agreed after the meeting that the company is betting much on the hope of earning out a market niche with the Macintosh.

Apple's earnings for each of the next two quarters ending Dec. 31 and April 1 "should not be expected to exceed the eight cents [per share] reported for 1983's fourth quarter, which ended on Sept. 30, 1983," Sculley said. Earnings in the \$5.1 million range reported in September would be significantly below the \$23.5 million reported last December and \$23.9 million reported last April.

It will take a year for Apple's earnings to return to the traditional return-on-equity level of about 25%, Sculley reported. "It is not in the best interests of our long-term business or our shareholders to compromise new product development, marketing

support of new products or development of enhancements to increase the competitiveness of existing products in order to show favorable short-term quarterly earnings results," he said.

## Analysts' Reaction

While Sculley encompassed the Lisa and the Apple II microcomputers in his remarks, analysts told *Computersworld* after the meeting that the company is counting on a big splash with the Macintosh to spur consumer demand.

"They are betting the company on the Macintosh" is the way that Michele Preston, an analyst with L. F. Rothchild, Unterberg, Towbin, put it. Preston said Apple claims to have 100 companies developing software for the expected micro.

Preston concluded that Apple hopes to establish the Macintosh as a standard apart from the IBM Personal Computer and will need a "spectacular" splash to do so. "Everybody is going to be dazzled by it; the question will be, 'Do the users buy it?'" she said.

Donald Brown, analyst with Shearson/American Express, Inc., is not dazzled by the new micro and said the Macintosh strategy "has high potential, but high risks." He said Apple will start manufacturing "revenue-producing" Macintoshes within two weeks and will begin selling them in January for about \$2,500. For a "downgraded Lisa," he

said, that price is too high in comparison to IBM's recently announced PCjr models.

According to Brown's projections, the company will only post an earnings ratio of 60 cents per share when fiscal year 1984 closes out next September, with Apple II sales remaining flat and Lisa inventories staying high. In the fiscal year just ended, the company reported earnings of \$1.28 per share despite the poor fourth quarter.

# IBM PCjr 'a Puny System,' Not Inexpensive, Says User

By David Myers

CW New York Bureau  
IBM's newly introduced PCjr is "a puny system," one of the microcomputer's first users said last week.

"People are going to buy it thinking it's an inexpensive system and find they need a lot more expensive equipment to really run it," said William R. Parks, a professor of microcomputing at Marquette Technical Community College in Phoenix.

A number of sources, including developers and builders in the personal computing aftermarket, told *Computersworld* last week that IBM deliberately designed the PCjr so it would not compete against the two-year-old Personal Computer.

"When [IBM] decided to go into this market, it essentially decided to make a machine that competes with the [Personal Computer]. So they built roadblocks in to keep people from turning it [PCjr] into a cheap [Personal Computer]," said an executive with an electronics component manufacturer who asked that his name not be used.

It is those "roadblocks" that have made the PCjr a target of attack by users who had hoped the new micro [CW, Nov. 7] would run the same programs at home that the Personal Computer runs at the office.

People who want to expand the PCjr to its full capabilities, or even far enough to make it useful as an at-home extension of the Personal Computer, may have to invest more money than they had originally planned. For example, the basic \$669 PCjr must be fitted with a disk drive; modern and display monitor to make it usable by corporate managers, bringing its price to \$1,813. A similarly configured Personal Computer, with 128K bytes of random-access memory and one dual-sided floppy disk drive, costs \$3,169.

The biggest difference between the two machines is the keyboard. The PCjr's keyboard — an under-\$50 component manufactured by Advanced Input Devices, an Idaho company — has no function keys and has been described by some first users as "toylike."

The PCjr keyboard "makes [the computer] feel like a different machine [from the Personal Computer]. That's going to be the biggest stumbling block to use of the system by corporate managers," one industry consultant said.

A rival keyboard maker, who spoke to *Computersworld* on the condi-

tion that his name not be used, said the problem with the keyboard is its "nonstandard size." PCjr's keyboard has 24 keys — 23 for letters and a "P" key — and the rectangular keys are widely spaced, more like a calculator's keypad than a typewriter's.

"Because of the missing function keys, there's no way this machine can be used at home by corporate managers. Someone who wants to run an accounting program, for instance, has to buy the other machine [the Personal Computer]," the keyboard manufacturer executive said.

Because of the keyboard's design, there is also some question of its durability. However, Peter Weis, vice-president of sales for Advanced Input Devices, who declined to say whether the company had produced the keyboard for IBM, said comparable products were rated for about 30 million operations.

Despite criticisms, however, few people believe IBM's smallest personal computer — built for the firm by Teledyne, Inc. — will fall to its target market.

"It's a dud, but so was the [Personal Computer] when it first came out," said Nick Cosentino, operations manager for Pure Data Ltd., a maker of multifunction boards for the Personal Computer and Personal Computer XT. Cosentino said the aftermarket helped win acceptance for the Personal Computer, and it will help win acceptance for the PCjr.

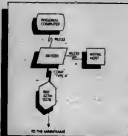
"IBM's master plan is to take all the business back themselves. They let suckers like us establish the market for them, then they come in and take it over," Cosentino said.

An IBM spokesman, however, disputed Cosentino's view, saying the technical reference manual on the PCjr would be available in IBM product centers in December.

IBM detractors disagree, pointing to the company's switch from Version 2.0 to Version 2.0 of the PC-DOS operating system at the introduction of the Personal Computer XT, believing it to be a tactic to discourage the aftermarket from cashing in on sales of the computer. PCjr runs under PC-DOS 2.1, raising fears that the company plans another operating system switchover.

Meanwhile, makers of expansion boards are rushing to get PCjr add-ons ready for market. Software writers are lagging behind, but said they should be ready with competing programs by the time PCjr shows up in the stores next February.

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## Refocus on Silicon, Gallium Arsenide

# IBM, Bell and Sperry Scrap Josephson Research

By Tom Henkel,  
CW Staff

Josephson junctions, the super-cooled, superfast circuits that many researchers thought held the key to the next generation of computer systems, appear to have lost their glimmer.

IBM, Bell Laboratories and Sperry Corp., the three top firms experimenting with Josephson junctions, have scrapped their research in favor of silicon- and gallium arsenide-based research projects. Sperry cut back its Josephson project significantly in June, citing basic problems with the technology. IBM and Bell Labs officially halted Josephson research in the past two months, citing technical problems with building Josephson circuits that have severely impaired the possibility of manufacturing cost-effective, reliable Josephson-based processors.

The technology is based on a theory developed in 1962 by British physicist Brian Josephson which states that circuits become superconductive, or lose almost all resistance, when cooled to near absolute zero (about minus 400 F). To get down to that temperature, the circuits must be immersed in a very cold substance such as liquid helium.

While the severe cutbacks by Sperry, IBM and Bell Labs do not signal that research into Josephson junctions is dead—all three organizations, as well as academic and military researchers, are still investigating the Josephson effect. They indicate there are apparently too many problems with Josephson technology for it to be released as an economical, reliable commercial product.

Computer manufacturers are driven to adopt the most economical means to an end to attract customers, and Josephson technology currently cannot provide that means. The government and military may now lead Josephson research since the government's budget, fed by tax dollars, is not specifically geared toward the production of an economical end product.

### Researchers Reassigned

IBM, which reportedly has spent more than \$100 million on Josephson research since 1976, has reassigned most of the 115 Josephson researchers at the Thomas J. Watson Research Center in Yorktown Heights, N.Y. The company also shut down an experimental Josephson manufacturing project at its East Fishkill, N.Y., plant that was part of the research and development effort.

About one sixth of IBM's Josephson research team will continue to work on cryogenic devices, an IBM spokesman said. They will work on gallium arsenide- and bipolar silicon-based devices.

Bell Labs, which one industry watcher estimated has spent about \$50 million to \$75 million on Josephson, has reassigned all but one or two of its Josephson researchers and has stopped all development of Josephson devices. Thomas Fulton, a member of the technical staff at Bell Labs, said in a telephone interview last

week that the Josephson project started to wind down about a year ago, when lead researchers on the project decided to refocus their efforts on gallium arsenide and optics research.

However, the researchers' refocusing was not done in an effort to find a replacement for the Josephson technology, Fulton noted.

"We could show no immediate application [for Josephson junctions] in telecommunications," a Bell spokesman said, adding that technical problems with the Josephson technology made its use appear unrealistic when compared to recent advances in gallium arsenide and silicon devices.

Sperry, which has been researching the Josephson effect for about as long as IBM, virtually killed its Josephson project because of problems in maintaining the low temperature conditions required to promote the Josephson effect, a spokesman told *Computerworld* last week. The spokesman added that Sperry could not give an accurate estimate of how much it has spent on Josephson research because the research is spilled into other projects, such as silicon and gallium arsenide research.

Sperry has refocused most of its research on gallium arsenide, the spokesman said, adding that gallium arsenide appears to offer the poten-

tial of surpassing the performance expected from Josephson junctions.

Some scientists thought Josephson junction devices held the potential of offering circuits with sub-nanosecond switching speeds. A Bell Labs experiment developed a series of 548 Josephson circuits with internal switching speeds of about 1 nsec. However, the actual switching speed of the Josephson device was 75 nsec, about three times that of currently available mainframe processors. Bell attributed this to the long distances the information had to travel from the liquid helium bath to the parts of the equipment at room temperature [CW, July 5, 1982].

# YOURDON CONFERENCES 1984.

## STRUCTURED TECHNIQUES

ADVANCED STRUCTURED ANALYSIS  
13 Days  
Jan 23-27 Los Angeles  
Feb 6-10 Chicago  
Mar 6-10 Long Beach  
Mar 13-17 San Francisco  
Mar 13-17 New York

MANAGING PROJECTS IN THE STRUCTURED ENVIRONMENT  
13 Days  
Jan 16-17 San Francisco  
Jan 23-24 Indianapolis  
Feb 6-7 New York  
Feb 13-16 Los Angeles  
Mar 13-16 Chicago

STRUCTURED ANALYSIS AND DESIGN WORKSHOP  
10 Days  
Jan 18-20 Boston  
Jan 18-20 Minneapolis  
Jan 18-20 New York  
Jan 23-27 Denver  
Jan 23-27 Washington, DC  
Jan 23-27 Seattle

STRUCTURED ANALYSIS AND DESIGN SPECIFICATION WORKSHOP  
10 Days  
Jan 18-20 Chicago  
Jan 18-20 New York  
Jan 23-27 Denver  
Jan 23-27 Washington, DC  
Jan 23-27 Seattle  
Jan 23-27 San Francisco  
Jan 23-27 San Jose  
Jan 23-27 San Francisco

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Jan 23-27 San Jose  
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STRUCTURED ANALYSIS FOR REAL TIME SYSTEMS  
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Jan 18-20 Houston  
Jan 18-20 New York  
Jan 23-27 Denver  
Jan 23-27 Washington, DC  
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STRUCTURED QUALITY ASSESSMENT WORKSHOP  
13 Days  
Jan 6-11 San Francisco  
Jan 13-17 Chicago  
Jan 13-17 Dallas  
Jan 13-17 Houston  
Jan 13-17 New York

STRUCTURED SYSTEMS DEVELOPMENT  
11 Days  
Jan 6-11 Philadelphia  
Jan 6-11 San Francisco  
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SPECIAL PRESENTATIONS  
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IMPACT OF THE COMPUTER REVOLUTION  
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# Circuitous Route Leads Exec to Telecom Post

By Katherine Hafner

**CW Staff**  
MEMPHIS, Tenn. — Patrick Greenish's career path has been a circuitous route to the top. Recently appointed vice-president of international telecommunications for Federal Express Corp., he is an attorney whose involvement in data communications came by way of his legal practice.

The 35-year-old Greenish was born in Morocco and raised in Western Europe. He received his bachelor's degree in secondary education from St. Francis College in Loretto, Pa., and later graduated from Western New England College in Springfield, Mass., with a law degree.

Greenish had a private law prac-

tice from 1976 to 1978, then went to Western Union International, Inc. in New York City as a corporate attorney.

It was at Western Union International that he gained the technical knowledge of telecommunications that would catch the eye of Federal Express.

"At [Western Union] I received an overview of the working of international telecommunications operations... the various circuitry and services offered between the U.S. and international points, including a basic understanding of the European packet-switched networks and interface requirements between Europe and the U.S.," Greenish recalled.

In 1982, Greenish was made director of European international relations at Western Union. He was in Europe when he crossed paths with some Federal Express executives. "Federal was looking for someone with a telecommunications background. Throw that in with a little bit of legal background, and mine was exactly the type of experience they were looking for."

## Legal Background

"My legal background will help me out a great deal in this job," Greenish added. "We're in the process of setting up an international telecommunications department that will require some sort of entity overseas."

In his new position, Greenish is in charge of the international portion of Federal Express' planned electronic delivery service as well as setting up the international network for data processing.

The new electronic delivery service, expected to go into operation between April and July of next year, involves sophisticated facsimile transmission of documents with guaranteed two-hour delivery.

"One of the requirements of my job is to have an understanding of overseas international telecommunications and monopolies," Greenish said.

"My tenure at Western Union prepared me for that. I also have good



"I think I know enough to get me by, but I wouldn't want to hold myself up as having any expertise in the telecommunications area," says Patrick Greenish, Federal Express' newly appointed vice-president of international telecommunications, who started his career as a lawyer. "I've always relied on others for that."

experience with the line requirements and procurement requirements to set up the network. I think I have an added advantage in that I'm in a better position to figure out where we can establish subsidiaries." Greenish is the first to admit that his strength does not lie in technical matters.

"I think I know enough to get me by, but I wouldn't want to hold myself up as having any expertise in the

telecommunications area," he said. "I've always relied on others for that."

Greenish's job was created when the international network grew to the point where a separate director was needed to handle the project.

"It's a little overwhelming right now because I have to develop a staff," Greenish said. "But Federal Express is a great place to work. It's a very people-oriented company."

## How Charles E. Ames

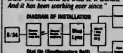
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## House Poised for Final Vote on Bill Prohibiting Phone Net Access Charges

By Phil Hirsch

CW Washington Bureau  
WASHINGTON, D.C. — Legislation that would wipe out the rate cuts recently proposed by AT&T for many business communications services was up for a final vote in the House of Representatives last week as *Computerworld* went to press.

The bill, H.R. 4102, would prohibit the Federal Communications Commission (FCC) from imposing surcharges next April on residential and single-line business customers for accessing the long-distance telephone network.

It would also require users of bypass facilities to help pay for the upkeep of local exchange networks.

The surcharges are a key part of an FCC plan to change the way local telephone companies are reimbursed

for providing access to the long-distance network.

## A \$6.5 Billion Tab

Today, long-distance carriers pay for this service and pass on the charges to their customers; the tab comes to about \$6.5 billion annually.

Under the FCC's access charge plan, a major portion of this \$6.5 billion would be paid directly by all users of local telephone service. Residential and single-line business users would contribute roughly a third of the total amount next year and approximately two-thirds beginning in 1989.

Part of the rest of the \$6.5 billion would come from multiline business subscribers in the form of a monthly surcharge on each local loop. The balance would be paid by long-dis-

tance carriers, which would pass on the charges to their customers.

If H.R. 4102 is enacted, much of the residential/single-line business users' share of the \$6.5 billion will have to be assumed by multiline business subscribers.

AT&T, which recently proposed a new tariff based on the FCC plan — one offering substantial rate cuts to users of longer distance and/or higher bit-rate services — has said it will cancel the reductions if the legislation is enacted.

Before that can happen, the full Senate must vote on a companion bill (S. 1660), and any differences between the House and Senate measures will have to be worked out by a conference committee.

Senate action on the above is scheduled next month.

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# Tandem Adds Communications Front End

(Continued From Page 1)

360 lines. In addition, each line can be individually microprogrammed by transmission and line type, electrical interface, protocol and communications speed, allowing a broad assortment of line configurations to coexist in the same network, the spokesman said.

Communications attributes of the processor include:

- Three transmission types — asynchronous, byte synchronous and bit synchronous.
- Two line disciplines — point-to-point and multipoint.
- Two electrical interfaces — RS-232 and V.24/V.28.
- Multiple protocols capable of supporting the IBM 3270 terminal,

2780/3780-class equipment. X.25 packet switching and Tandem's own video display units and point-of-sale terminals.

• Transmission rates ranging from 50 bit/sec to 56K bit/sec.

An important difference between Tandem's latest front-end processor and its three predecessors is that the enhanced product assimilates many of the communications functions previously assigned to facilities like interrupt handlers, controllers and system processes. The 6100 cuts a central mainframe's communications overhead by 20% to 40% and in so doing frees the machine to devote its resources to practical applications, the spokesman said.

The most recent addition to Tan-

dem's front-end processor family consists of two main parts: communications interface units and line interface units. The communications interface units support either Tandem's Non-Stop II or TXP mainframes and are always connected to two such CPUs at the same time.

To ensure the continuous processor availability that has become the hallmark of Tandem's Non-Stop architecture, the communications interface units are installed in pairs, with up to three pairs able to operate with each dual-CPU complex. If one of the communications interface units in a pair breaks down, its twin will automatically fill the breach and allow its two associated mainframes to continue operating without inter-

ruption or performance degradation, the spokesman said.

Every communications interface unit pair consists of as many as 15 line interface units, each of which corresponds to a different communications line, the spokesman said. The line interface units consist of two printed circuit boards, a line interface module and a communications line interface processor. Housed in their own separate enclosure, the line interface units can be situated up to 200 feet from their cooperating communications interface units.

As their name suggests, the line interface units provide the 6100's transmission lines with their necessary electrical and mechanical interfaces. The communications line interface processors are the modules that allow each of the lines to be individually programmed with its own mix of communications attributes.

To define or revise a given line's protocol, users need only to download the microcode from their Tandem mainframes to the appropriate communications line interface processor, which holds its own dedicated microprocessor and 64K bytes of random-access memory (RAM).

In addition to permitting lines to be configured independently, a communications line interface processor's on-board microprocessor and RAM enable the 6100 to be easily upgraded to support future communications capabilities as they become available, the spokesman said.

Tandem has already announced its intention to make the 6100 compatible with IBM's Systems Network Architecture by the end of next year.

A basic 6100 subsystem configured with two communications interface units costs \$23,800, with each line interface unit selling for an additional \$1,940. Tandem is located at 19333 Valco Pkwy., Cupertino, Calif. 95014.

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## Groups Denied Tax Exemption

(Continued From Page 1)

dent Raymond J. Grande, the open-door policy has created problems. Prime has refused to send representatives to PUG-East this February in Baltimore because non-Prime vendors will be present.

Lenhardt said the IRS appears to be putting users groups in a no-win situation. If the groups deny other vendors the opportunity to participate in and display products at meetings, tax-exempt status will be denied because the users group has too narrow a focus. However, if all vendors are allowed to participate and display products, the IRS will consider the meetings trade shows and also deny tax exemption.

Tom Clark, who publishes an independent newsletter for users of Burroughs Corp. hardware, said the IRS ruling may have an adverse impact only on organizations like the Cooperative Users of Burroughs Equipment if the organizations turn a profit. As long as the users groups spend all the money they take in over the course of a year, tax-exempt status should not be an issue, he said.

# Vendor's 32-Bit Non-Stop CPU User's Tests Jibe With Tandem Claims for TXP

By Jeffrey Beeher

CW West Coast Bureau

SACRAMENTO, Calif. — One of the beta test sites for Tandem Computers, Inc.'s first 32-bit processor has confirmed the vendor's claim that the recently introduced machine [CW, Oct. 24] has two to three times the performance of its most powerful sister system.

During a recent benchmark test at System Integrators, Inc., a configuration built around three Tandem TXP processors reportedly delivered 24 to three times more computing power than a similarly configured cluster of Tandem's older Non-Stop II's.

The test results jibe almost exactly with the performance claims that Tandem made for the TXP when the transaction processing machine was formally introduced during an Oct. 18 press conference held in New York.

Founded about 10 years ago, System Integrators ranks among Tandem's largest OEMs, according to Jack Pritchard, who is the users organization's general director of marketing.

For years, the company has bought large quantities of Non-Stop mainframes and then resold them as modules in an electronic publishing system that allows newspapers and magazines to automate their editorial, production and advertising functions.

At some unspecified time in the future, System Integrators will probably begin to upgrade its current product line by expanding its selection of Tandem processors to include the month-old TXP, Pritchard maintained.

## Under Own Roof

But before it begins selling the TXP to its customers, the OEM insists on experimenting extensively with the mainframe under its own roof. System Integrators' effort to familiarize itself with the 32-bit machine began around Sept. 1, when the company installed its first TXP in its in-house research and development department.

The installation project calls for System Integrators to replace eventually its existing R&D system, built around four 16-bit Non-Stop II's, with three 4M-byte TXP's. Among its main benefits, the conversion effort is expected to boost substantially the power of the company's new product development system, Pritchard predicted.

"Of course, we could achieve the same performance increase just as easily by simply installing some additional Non-Stop II's alongside the ones we already have," he said, "but we decided instead to acquire some of the new TXP's in the hope of gaining some valuable hands-on experience with the machines."

## Software Prep Tasks

For nearly two months after they first arrived at System Integrators' doorstep, the three TXP's occupied a section of the firm's manufacturing floor. There, for the better part of a week, company employees devoted themselves to a variety of software

preparation tasks that included loading the freshly uncrated processors with their necessary test information and data bases.

Then, in late October, the vendor began dismantling and transporting the CPU's from their original installation site to a permanent location in the organization's development area, where the products were slated to be reassembled and retested early this month.

For about two weeks beginning in late September, System Integrators conducted an assortment of performance comparison tests involving a three-processor Non-Stop II configuration and a similarly configured

TXP system.

In one of the tests, which lasted an hour and entailed the processing of almost 14,000 transactions, the vendor loaded the Non-Stop II's to 50% of their capacity and then steadily increased the computing burden to 80% and 90%.

## Responding to Applications

After observing how system performance changed in response to growing applications work load, the firm duplicated the procedure with a TXP-based configuration.

In the end, according to Pritchard, the 32-bit machines were found to process on-line transactions as much

as three times faster than their 16-bit predecessors — a finding that corroborates Tandem's own performance ratings.

The results of the independent benchmark tests also affirmed Tandem's earlier claim that the TXP is fully software-compatible with the Non-Stop II. Pritchard added, although "the system generation process for the two machines are quite different."

That discrepancy between the transaction processing engines forced System Integrators to "reger" its TXP's before it could finally press them into service, according to Pritchard.

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- how to overlap the phases to make the best possible use of your staff and to keep the user happy by delivering the most critical parts of the system when he or she wants them

- why you must involve the user from Day 1 if you want the new system to be a success
- what tools make it easy for the user to explain the current system to understand the new system, and to catch design mistakes early in development
- how to avoid creating piles of paperwork that no one ever looks at

- what data flow diagrams are, why you should use them, and how to use them so they're helpful, not a pain in the neck
- how and when data-dictionary rich queries can help you describe the data for the system

- how to design the files or database for a system
- how to break the system down into logical functions and programs
- how to use structured programming to get the most out of your code, test, debug, and most important, maintain

and make the system easier to maintain

- how to simplify documentation and yet have all the information you need to make changes later on

In short, you'll learn down to earth ways to speed up development, cut down on bureaucratic paperwork, and create systems that are reliable and easy to maintain.

## 128,000-line system completed by one person in 12 months

Most of the tools you'll find in this book are data flow diagrams, program dictionaries, and structured programming. It's all new. But let's face it. Much of what's been said about them is useless when it comes to developing a modern, interactive business system.

In contrast, this book focuses on practical ways to use these tools. And it falls all the steps together into a single method that works.

In fact, the author, Steve Erlich, used this method to develop a complete operational and informational system for a grain broker age an interactive system of about 128,000 lines of COBOL code.

Steve did the whole system himself from start to finish, in a year (That counts the 3 months he was available part time to do the problems and provide enhancements after installation.) That averages out to more than 450 lines of tested COBOL code per day.

Now I admit, not everyone will reach that level of productivity. There are just too many variable factors you can't control. Still, I'm convinced you'll improve your productivity if you use this method.

At least it's worth a try. After all if it's true that the average COBOL programmer writes less than 5,000 lines of tested COBOL code per year, what have you got to lose?

## Why this book is effective

The main reason this book is so effective is that Steve uses the technique system as an example of every phase in the development method.

That means you'll see how the method works when it's applied to the complexity of a real system. You'll find out what advantages it offers over your current method. You'll gain plenty of real life perspective if you aren't already involved in system development at your shop.

In short, you'll learn a lot more than you would from a book that uses trivial examples to illustrate complicated ideas.

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# Users Flock to Portable, Transportable Machines

## TRANSPORTABLES\*

Microcomputer	RAM	Size	Operating System	Number of Applications Software	Storage	Display	Price as of 6/83
IBM PC	128K	16"	MS-DOS	1	2 Floppy Drives	9 in.	\$1,299
IBM PC	128K	16"	MS-DOS	1	1 Floppy Drive	9 in.	\$1,299
Computer Devices, Inc. Del 2000 A	64K	16"	MS-DOS	—	1 Floppy Drive	10 in.	\$3,220
IBM PC	128K	16"	MS-DOS	1	2 Floppy Drives	9 in.	\$1,299
IBM PC	128K	16"	MS-DOS	1	2 Floppy Drives	9 in.	\$1,299
IBM PC	128K	16"	MS-DOS	1	2 Floppy Drives	9 in.	\$1,299
Non Linear Systems, Inc. Keypro 10	64K	8"	CPM	1	1 Floppy Drive 1 Hard Disk	9 in.	\$2,795
Keypro II	64K	8"	CPM	1	2 Floppy Drives	9 in.	\$1,795
Osborne Computer Corp. Osborne I	64K	8"	CPM	2	2 Floppy Drives	5 in.	\$1,795 Heavily Discounted
Osborne Corp. Osborne	64K	8"	CPM	3	2 Floppy Drives	5 in.	\$2,895
Radio Shack/Tandy Corp. TRS-80 Model II	64K	8"	TRS-DOS	—	2 Floppy Drives	9 in.	\$1,799
IBM PC	128K	16"	MS-DOS	1	2 Floppy Drives	9 in.	\$1,299
Teknides Systems, Inc. Tektite I	64K	8"	CPM	3	2 Floppy Drives	9 in.	\$1,499

\*Shaded Machines Indicate IBM Personal Computer Compatibility  
\*Source: International Data Corp.

\*Data Provided by Vendor.  
\*MS-DOS from Microsoft, Inc.

\*CPM, CPM 86 from Digital Research, Inc.  
\*TRS-DOS from Radio Shack.

(Continued from Page 1)

Bosomworth, president of International Resource Development, Inc. of Norwalk, Conn. "If your desk looks anything like mine, a small footprint is important."

### The Specter of Instability

Transportables made their appearance on the computer scene two years ago, when Adam Osborne introduced the Osborne I, an 8-bit suitcase with bundled software and a peephole screen. The Osborne I "was a good deal for a two-disk system,"

Bosomworth said. "The portability was an extra."

Oscilloscope maker Non-Linear Systems, Inc. then jumped into the transportable fray with a somewhat larger screen and a plan to take much of Osborne's business away.

At last count, 27 companies were offering a transportable of some type. Even the staid Tandy Corp. recently repackaged its Model 4 into a

handy transportable machine and will this week begin offering it through its Radio Shack outlets, just in time for Christmas.

### Roller-Coaster Times

Despite all this activity in the transportable market, the man who started the trend toward transportable in micros may have also started the trend that all the micro world

had been fearing — the shakeout.

Osborne's filing for protection under Chapter 11 this past September reminded many users that the micro business is still in the roller-coaster times of introduction and bankruptcy.

However, in spite of Osborne's misfortune, industry experts believe the transportable market is probably the most insulated from a shakeout. "Osborne had a management problem and a distribution problem," Levin explained. Osborne "got their dealers mad by announcing the Executive system [a more powerful version of the Osborne I, with extended features] without letting their dealers know."

The uncertainty generated by what appears to be the beginning of a shakeout has been one factor contributing to many users' hesitancy about buying a transportable. Perhaps to prove that they will remain a powerful force in the desktop market, transportables have added hard disks (Non Linear Systems, Inc.'s Keypro 10) or IBM compatibility (Corona Data Systems, Inc.'s Portable PC 2) or both (Eagle Computer, Inc.'s Spirit XL).

The reliability of hard disk portables has been questioned by some, but almost everyone agrees that IBM compatibility is a good idea (see story at left).

### The Briefcase Computers

The portables — those that are the size of a briefcase rather than a suitcase, such as the Sharp Electronics Corp. PC-5000 — are currently as small as computers can get without significantly losing the functions of a desktop computer.

With features such as a flip-up LCD (or, in the case of Grid Systems Corp.'s Compas, an electroluminescent display), portables are designed for every travel. But most portables fall short of being categorized as full systems because it is difficult to carry

## Hopping on Two Bandwagons at Once

Buying an IBM-compatible transportable computer is like hopping on two bandwagons at the same time, but there are a number of good reasons for doing so.

The most obvious reason is to be compatible with IBM's desktop Personal Computer.

The next reason is that there are barely enough IBM Personal Computers to go around; the average wait for delivery is six weeks. Even when

a user can get one, he pays extra for almost everything, such as disk drives and extended memory.

Compaq Computer Corp.'s 16-bit transportable (and most other competitors), on the other hand, are sold complete with three software packages and one printer port bundled in for about the same price as a basic IBM Personal Computer.

While IBM is not expected to release a transportable or portable

computer anytime soon, at least six healthy companies offer transportables that are compatible with the Personal Computer (see chart). Although true compatibility is hard to measure, the clear leader in this market is Compaq, whose machine is so IBM-compatible that "even if IBM changes its operating system, Compaq will be in a good position to survive," Ellen Levin, an analyst with International Data Corp., said.

Osborne Computer Corp.'s shaky existence, combined with uncertain futures for transportable makers like Computer Devices, Inc. — which, like Osborne, has filed for protection under Chapter 11 of the bankruptcy code — is yet another reason why users are looking for the security of an IBM environment.

Why isn't Big Blue planning to come out with a transportable? "IBM has a policy never to enter a market where other companies are making their living solely on the one product in that market," explained one industry watcher, who chose to remain anonymous. In other words, IBM will not attempt to put the transportable/compatibles out of business. Nor will it play "me too" to Compaq and others.



Compaq Computer Corp.'s IBM-Compatible Transportable

# With Sales Seen Skyrocketing Through the '80s

## PORTABLES

Manufacturer	Dimensions	Size	Built-In Modem	Storage	RAM	Display	Comments	Price
Convergent Technologies, Inc. Workmate	Notebook Size <sup>1</sup>	8	Yes	Microcassette Drive	16K	16 Lines x 40 Char. LCD	Microcassette Software Available	\$995
Commodore Business Machines Executive 64	5-in. x 14½-in. x 14½-in.	8	Yes	2 Floppy Drives	64K	6-in. Color Monitor	PET-Compatibility Optional	\$695
Spacem America, Inc. HLT-20	Notebook Size	8	No	Microcassette Drive	16K	3½-in. x 4 Lines x 80 Char.	Built-In Microprinter	\$795
Gavilan Computer Corp. Gavilan	9 D. Briefcase Size	16	Yes	3½-in. Floppy Disk	80K	6 Lines x 80 Char. LCD	Touch-Pad Panel Pointer Control	\$3,995 <sup>2</sup>
Grid Systems Corp. Compass	9 D. Briefcase Size	16	Yes	Bubble Memory + Cmos	256K	Flat Panel 24 Lines x 80 Char. LCD	Puma III-008 Operating System	\$8,150 <sup>2</sup>
NEC Home Electronics USA PC-6801	Notebook Size	8	No	Cmos	16K	8 Lines x 40 Char. LCD	17 Applications Packages Included	\$790
Radio Shack/Tandy Corp. TRS-80 Model 100	Notebook Size	8	Yes	Cmos	8K	8 Lines x 40 Char. LCD	Address Book and Schedule Date Books Included	\$790
Sharp Electronics Corp. PC-5050	11 in. Briefcase Size	16	No	Bubble Memory	128K	8 Lines x 80 Char. LCD	Attachable Thermal Printer Optional	\$2,500 <sup>2</sup>

Notebook Size<sup>1</sup> = Approximately 6½-in. x 11-in. x 1-3 in.  
<sup>2</sup>As of June 1983

printers and disk drives in a briefcase. As Levin pointed out, portables are "usually supplements to other systems."

The briefcase portables vary widely in price and functions, with the Grid at the high end (\$8,150) and the Sharp at the low end (\$2,500). In the middle range, there is even what some industry watchers have called "the first designer computer" — Gavilan Computer Corp.'s Gavilan, which features a touch-panel cursor control.

## Notebook-Size Computers 'Wholly Remarkable'?

By Jim Bartimo

CW Staff

In a current science fiction best-seller called *The Hitchhiker's Guide to the Galaxy*, the guide itself — repeatedly described as "a wholly remarkable book" — "is not a book at all. Instead, it is a book-size computer containing most of the knowledge of the galaxy."

While today's notebook-size computers aren't quite as remarkable as the *Hitchhiker's Guide*, they provide users with a handy computer away from home, especially when traveling (or hitchhiking, as the case may be).

So handy are these computers that there will be some 140,000 of them at large in 1984 and 540,000 in 1987, according to Future Computing, Inc. They will account for \$154 million in retail sales in 1984 and \$486 million in 1987.

Although notebook-size computers are limited in application, what they can do is wholly remarkable. The three major notebook-size computers available today contain both a word processing package and a Basic compiler burned into the read-only memory (ROM); they need no cassette to operate (although a cord is provided for ac use and recharging).

### Communications Software

Because they are designed mainly to supplement home or business computer systems, most of these "kneetops" come with communications software and can work with a

Future Computing expects the market for briefcase-size machines to grow from 100,000 in 1984 to 350,000 in 1987. This will account for \$330 million of the desktop market in 1984 and \$1.4 billion in 1987.

### Some Limitations

While Hemphill believes these machines have a lot of power, "my

built-in or external modem.

The two notable points about these systems is that most of them feature a full-stroke keyboard and a price tag of \$1,000 or less.

With Cmos storage, the only thing these systems really lack is a better display. LCD is the preferred display today, but Kenneth Bosomworth of International Resource Development, Inc. pointed out that "flat panels are coming down in price," as are other display technologies.

### At Best for Memos

The kneetops are perhaps at their best when they are used for writing short memos or programs, since even 32K bytes of random-access memory can be limiting. However, programs can be downloaded or uploaded with tape cassettes, and there seems to be plans to provide the lap-size machines with monitors and disk drives as well.

Third-party vendors are already bringing out additional tape cassette software and peripherals, such as the thermal microprinter about to be released by Teletex Communications Corp., but too many peripherals may detract from the unique portability these machines offer.

A relatively new entry into the notebook-size arena is Convergent Technologies, Inc.'s Workmate. Expected by some to open up yet another floodgate in the portable marketplace, the Workmate — with its "Childer" keyboard — is designed

(Continued on Page 12)

## Product Spotlight

guess is that they're not going to take over the desktop machine because they'll always have some limitations. But they will have an impact."

Bosomworth credited the advent of the briefcase computer to three recent technological advancements — the modem on a chip, Cmos nonvolatile memory, and the reduction of memory in both size and cost. "A 256K-byte memory chip will cost \$10

next year," he said. "You can do a lot with 256K [bytes] of memory and an 8-bit computer."

Cmos allows stored files to remain intact with a very small power source such as a common household battery and a backup nickel cadmium battery. While some portables like Cmos use bubble memory — once the rage — Cmos is currently the preferred form of storage.

"The Compass is real expensive, but once bubble memory technology improves, the cost will come down," Levin predicted.

## Major Airlines and Their Policies On Portable Computers

- American Airlines** — Allows hand-held computers only, those that typically have a one-line display and very limited capabilities.
- Delta Airlines** — Allows the use of portable computers.
- Eastern Airlines** — Prohibits the use of all portable computers.
- Republic Airlines** — Claims to allow portable computers despite warnings in its in-flight magazine against their use.
- TWA** — Allows the use of portable computers.
- United Airlines** — Allows hand-held calculators only.

Convergent Technologies, Inc.'s Workmate

# A Hands-On Review of Three Notable Notebooks

By Jim Bartimo  
CW Staff

Testing the notion that portable computers can be used by anyone, this writer tried, in the course of writing this Spotlight, the three that are considered the most popular. In fact, this story was written on the Radio Shack TRS-80 Model 100, then transmitted to *Computerworld's* complex of Digital Equipment Corp. PDP-11/70 minicomputers for typesetting.

What follow are personal evaluations of the three portables:

## Radio Shack's TRS-80 Model 100

Clearly the hands-down winner with its built-in modem and communications software, the Model 100 transmits at 300 bit/sec with ease and reliability. Software extras include a rudimentary pair of data base management systems for calendar scheduling and note taking.

The word processing program is easy to use, especially since text can be manipulated via a number of clearly labeled function keys.

The major drawback of the Model 100 is its limited memory. By the time you upgrade to 32K bytes of random-access memory (RAM), you will have crossed the \$1,000 dollar purchase mark. However, if you remain with the standard 8K bytes of memory and don't upgrade to at least 24K bytes of RAM, there will only be enough room to store a few pages of text.

## NEC PC-8201

This machine could have walked off with first prize if only it had a built-in modem. While the company claims it doesn't want to force you to buy a modem in case you already have one, carrying a full-size modem and/or acoustic coupler defeats the purpose of portability.

This machine is otherwise identi-

## 'Kneetops' Seen Supplements To Host System

(Continued from Page 11)  
mainly for calculations, such as in portfolio analysis.

"The Worklate is aimed at a number of vertical markets," according to Bosomworth. "You can get Convergint to put programs in ROM for you depending on what you want to do with it."

Amidst all that is remarkable about the notebook-size computers is one irony. Although they are the perfect dimensions for the back seat of a jet, at least three major airlines have prohibited their use on-board their flights (see box).

"We had an incident where a portable computer caused interference with the flight controls of the aircraft," a United Airlines spokesman said. "We'll have the results of that incident in 45 days."

Other airlines, such as Eastern Airlines, are waiting for a ruling from the Federal Communications Commission before allowing these lap-size computers near the 32 computers already on-board a 737 jet.

## Product Spotlight

cal to the Model 100, but comes with a bevy of programs on tape and burned into read-only memory, the required cables to hook up to a tape cassette and superior cursor-control keys.

Another feature of the PC-8201 is removable, nonvolatile CMOS RAM packs that give added memory — 32K bytes a crack — to virtually eliminate any memory-shortage problems.

## Epson America, Inc. HX-20

It's hard to know what Epson was thinking when it brought out this

machine, but perhaps the HX-20's drawbacks can be attributed to its early entry into the market.

The HX-20 has no built-in modem or any communications software as yet, so transmitting to another machine is virtually impossible at this point.

The machine does have a built-in printer and an optional micro cassette drive — perhaps Epson was hoping the HX-20 could be more of a stand-alone device — but alas, with a 3½-in.-wide, 4-line by 20-char screen, it's too easy to go blurry eyed while writing a program or memo.

The HX-20's virtual screen extends somewhat beyond these dimensions, but to little avail.

Epson added Skisoft, Inc.'s Skewriter word processing after the introduction of the machine; this word processing software is perhaps a bit better than its competitors' WP software. Moreover, the Epson keyboard is of higher quality. However, none of this is enough to make up for the HX-20's other deficiencies.

The Epson HX-20 uses Cmos for storage, but, unlike its competition, relies totally on a rechargeable battery for power instead of four AA batteries.

NOTE: Microsoft, Inc.'s version of Basic appears in some form in all three of these notebook computers.

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with a single cable.





# In High-Volume Environment Tool Helps Firm Compare DBMS Performance

By Paul Gillin

CV Staff

BOSTON — It is a refrain that is sung all too often: The project looks good on paper, meets all the specifications and is completed on deadline. But once the system starts to handle some volume, response time goes out the window.

The DP department at John Hancock Mutual Life Insurance Co. is determined not to let such chords mar its installation of IBM's IMS data base management system (DBMS). The evaluation and installation of IMS is proceeding with the help of VisiCorp's Visicalc and Crystal, a performance management utility from BCS

Systems, Inc. of Waltham, Mass.

Hancock, which employs multiple IBM 30 series mainframes at its corporate headquarters here, began re-evaluating its DBMS environment early last year. After sifting out proposals from a number of vendors, the choice came down to Cullinet Software, Inc.'s IDMS and IBM's IMS. Crystal was then used to build performance models for the two finalists.

The head-to-head evaluation was targeted at comparing the performance of the products in acquiring data and examining their relative resource consumption in high-volume environments, according to Tom

*The head-to-head evaluation was targeted at comparing the performance of [Cullinet's IDMS and IBM's IMS] in acquiring data and examining their relative resource consumption in high-volume environments. ... Project members input the path links used by both DBMS and created a transaction-heavy model to run through Crystal.*

Moran, a Hancock consultant. Using information supplied by both ven-

dors, project members input the path links used by both DBMS and created a transaction-heavy model to run through Crystal.

"We got rid of the on-line and application environment and focused on data base access, specifically over a wide number of paths," Moran said. "We used a data base that required 100 [IBM] 3350 spindles. We're talking about an application with 500,000 to 750,000 transactions going against it every day."

The performance model "pointed up some other things that did not appear in the initial study," Moran said. "Using Crystal, we narrowed down [the technical differences] and did a further technical examination."

Although the products performed similarly, IMS proved more efficient at random data acquisition under heavy volume, Moran said. This fact, brought out by the performance model, "made the choice apparent. A lot of issues were raised in the modeling process."

The installation of IMS will continue into 1985, with the design aided by a three-tiered structure using Crystal, Visicalc and IMS "snapshots," which are standard path links used by IMS for various processes. A novel use of the popular Visicalc package allows designers to create module or data path design on the spreadsheet and, thus, bypass the intensive calculations that the process requires.

## Gives Design More Depth

"First, the designer can use Visicalc to get a relative idea of the impact of a particular design and then move it to Crystal to give general analytical models compared against other possible designs," Moran said. "Crystal allows you to build a model of your application, which normally would be a tremendous manual effort. It gives your design a little more depth."

The best designs are then compared against IBM snapshots to determine resource requirements.

Crystal also creates a model that can be fed into a model of the DP installation's internal environment created on Best/1, a capacity planning package also from BCS. By running the Crystal model in conjunction with the Best/1 model, the impact of the data base on CPU time can be estimated.

"The productivity benefits are that the designer, in the early days of his design, puts some of his assumptions into the model to see what the benefits are," Moran said. "He does not have to wait until the design is developed and programmed. So it helps a little bit in the quality side."

"It also helps that you don't have to prototype, which on a large project can be quite a savings," he added. "It also can provide a check mechanism of the model against the final result. It gives you some sort of baseline of expectation."

Because installation is still continuing, it is impossible to compare the accuracy of the Crystal model against actual performance, Moran said. However, "we feel rather good about it."

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# SEC Plans Electronic Filing of Disclosure Forms

By Peter Bartollik

CW Staff

WASHINGTON, D.C. — Those who like to play the stock market may be able in the not-so-distant future to analyze opportunities and immediately execute confirmed buy and sell orders from their homes.

The Securities and Exchange Commission (SEC) announced recently that it has contracted for a study to establish a pilot project for the electronic filing of disclosure forms by reporting companies, as well as for instant dial-up access to the accumulated data by the investing public.

Some 9,500 publicly held companies file more than 175 types of forms with SEC, ranging from stock prospectuses to annual reports and tender offers. SEC would like to reduce this mound of paperwork.

According to an SEC spokesman, reporting companies generally have their disclosure reports printed and delivered to SEC headquarters here. The reports are then distributed to staff offices responsible for review, copied onto microfiche and then made available to the public through SEC's public reference rooms. "Summaries of some of the information in these reports are eventually distributed by private firms through computerized data banks, but the

lag time can be three months or more," the spokesman said.

Commission Chairman John S. R. Shad wants to establish a means for reporting companies to file their reports electronically. He sees that development speeding up the public's access to the data provided by companies.

Mitre Corp. has been contracted by SEC to examine the information to be pro-

cessed, evaluate available technology — including security — and costs and advantages and disadvantages of various system approaches. A pilot program involving an as yet undetermined number of companies will begin some time next year and will be tested and debugged for at least one year, the spokesman said.

Whereas typical investors now must wait while finan-

cial analysts digest and re-gurgitate the many filings, SEC foresees home computers and data bases in the future providing instant analysis in the home and the office. By the time the system is completed, the spokesman said, "It is expected that investors will be able to enter their market orders directly and receive instant execution confirmations on their own computer terminals. They

will also be able to retain their complete portfolio in their data banks and instantly price them to the market."

Through links to software systems, analysts and investors should be able to display all listed stocks that closed the previous day, with crucial factors and ratios such as stock prices above or below five times earnings, four times cash flow, 75% of book values per share and so forth.

## Northwest Bell Cited by FCC For Violation

WASHINGTON, D.C. — Northwestern Bell Telephone Co. was fined \$80,000 last week by the Federal Communications Commission (FCC) for violating the company's Second Computer Inquiry decision, which says that AT&T and its operating companies must market terminal equipment through separate subsidiaries.

Northwestern Bell transferred ownership of its installed terminal base last June to AT&T Information Systems, the separate subsidiary established by AT&T, to comply with the FCC order. However, it continued to provide maintenance and other support to the users, which the FCC said violated Computer Decision II.

Virtually all of Northwestern Bell's terminal support activities have now been transferred to AT&T Information Systems, and the remainder soon will be, according to an FCC spokesman. He added that he expects Northwestern Bell to appeal the fine.

# WHY YOU SHOULD RECOMMEND A KAYPRO EVEN IF YOU DIDN'T BUY ONE YOURSELF

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More than likely, it was a long year's education that sent you into a complex maze of trial and error. You spent a lot of time asking questions in computer stores. More time hunting for answers in computer books. Even more time investigating all the hardware, let alone software options you had to consider.

It was a hard way to get what you needed. A year that earned you an honorary degree in computer engineering and the status of a computer buff.

But just between us buffs, would you recommend a year like that to a friend?

## FOR THE FIRST-TIME BUYER, KAYPRO IS A GODSEND.

We think the hard way is the wrong way to have to buy a computer. After all, a business person shouldn't be required to make de-

cisions better left to an engineer.

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approach to making and selling our Kaypro II. Rather than a starter system, with options you buy piece for piece, it's designed with all the integrated hardware and software it needs to be fully functional.

Off the shelf, Kaypro II is completely ready for business. We think that's what the first-time buyer really needs.

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Since we don't consider a monitor, disk drives, interfaces or

other hardware as optional extras, all Kaypro's hardware comes complete in an integrated system. Except, of course, for a printer. As you know, some people don't need one. And those who do must decide whether they need dot matrix or letter quality printing.

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# Felony Charges Filed Against Alleged Hacker

By Katherine Hafner

CW Staff

LOS ANGELES — Ronald Mark Austin, arrested earlier this month, has been charged with a series of penetrations at computer sites around the world that left a path of altered records, stolen CPU cycles and general resolve among victims of the break-ins to revamp their password systems.

The 19-year-old Universi-

ty of California at Los Angeles (UCLA) sophomore allegedly used the U.S. Department of Defense's Advanced Research Projects Agency Network (Arpanet) to gain access to 200 accounts at 14 separate sites, including Rand Corp. in Santa Monica, Calif., and Cornell University in Ithaca, N.Y.

A concurrent investigation by the Federal Bureau of Investigation has also linked

Austin to a string of break-ins at Stanford University in Palo Alto, Calif.

"It's our belief it will cost all these different agencies and institutions hundreds of thousands of dollars to reprogram their systems in order to prevent this from recurring," commented Al Albargate, press secretary in the Los Angeles County district attorney's office, which arrested Austin.

All of the companies and schools allegedly tapped by Austin participate in Arpanet, Defense's packet-switched network for the research community. Although classified data has been transmitted over Arpanet, "the data is encrypted and cannot be accessed by anyone but the intended receiver," a Defense spokeswoman maintained.

"We can say that the au-

thorized accesses were known to the department at the time they were occurring and were recognized as unauthorized attempts to obtain data, but no information damaging to the national security was obtained," the Defense spokeswoman said.

## Relay Point

Paul Weeks, a public information officer at Rand, said, "On Aug. 29, an unauthorized user got into a Rand computer, then used the Rand system as a relay point to hop to another system on Arpanet. But no information was destroyed."

"I can't say Austin is the one who broke in here," Dean Kraft of Cornell's computer science department said.

"But it appears someone did log on to at least five of our accounts. As far as we can tell, no damage was done to our system. No records were altered. Maybe CPU cycles were stolen, but that's all we know," according to Kraft.

Kraft said that Cornell is taking measures to improve the university's password system.

## Inactive Account

According to Tom Tugend of UCLA's engineering and physical sciences department, Austin was planned down when another UCLA student was working late one night and noticed that someone was logged on to a University of California, at Berkeley account that he knew had been inactive for a long time.

"His suspicion was aroused. He told people in the computer lab, and the [district attorney's] office was notified," Tugend said. The district attorney's office began monitoring late-night activities on the UCLA computer system.

According to Albargate, Austin habitually gained access to UCLA accounts and "chatted" with two others: Kevin Poulsen of North Hollywood, Calif., and another person, who is identified only as Kareem.

Poulsen is under investigation, and Kareem has yet to be tracked down, Albargate said.

Authorities confiscated Austin's personal computer at his Santa Monica home on Sept. 22, along with a black-and-white television set he used for a screen, Austin was arrested Nov. 2 and awaits a Dec. 2 preliminary hearing. He is charged by the district attorney's office with 14 counts of maliciously accessing a computer system, which carries a maximum sentence of six years.

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At \$1595, Kaypro II is the least expensive serious business system we know of on the market today.

There are basic starter systems advertised for less. But their optional hardware and software can double or triple their basic price. So they can end up costing \$2000-\$3000 more than a Kaypro.

A good example is an Apple IIe. With a hardware configuration comparable to Kaypro II's, complete with comparable software, it lists for an average price of \$4400. \$2805 more than a Kaypro.

## IT OFFERS MORE CARE FOR THE MONEY.

Since disk drive memory capacity is always a concern, once again the idea is to get the most for the money. With two disk drives, Kaypro II gives you 400K for \$1595. With equivalent hardware, an IBM gives you 320K for about \$2800. And Apple IIe gives you 286K for about \$2400. So once again, Kaypro II delivers.

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The more you love computers, the more tempting it is to recommend a 16-bit vs. 8-bit

machine. You know that 16-bit systems are a little faster and have more power to run longer programs.

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1 Serial	Uniform - allows computer to read and write
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Keyboard	Xerox disks
Detached, 64-key	Disquettes
with numeric	Height: 8 inches
keyboard	Width: 16 inches
Software included:	Depth: 15 1/2 inches
Perfect Writer	Weight: 26 lbs.
word processing	(portable)
Perfect Speller	

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Every business person wants a computer to pay for itself in increased productivity.

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In fact, Kaypro II is one of the best sellers in the \$1000-\$5000 price range. And it got there largely because of the enthusiastic word of mouth, and word of press, of computer enthusiasts. Many of whom, after building their own systems, bought a Kaypro II as their second computer.

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# Japan Readies Backbone Cable for ISDN

By Phil Hirsch

**CW Washington Bureau**  
**GENEVA, Switzerland** — The first section of a 400M bit/sec fiber-optic transmission cable that runs down the center of the Japanese archipelago is scheduled to go into service next month. The cable will be the backbone of a new integrated services digital network (ISDN) that is intended to support the "advanced information society" being created by Japan's increasing use of computers and computerized information.

The quote comes from a paper presented here recently at Telecom '83, a worldwide telecommunications conference. The author is Yasuhide Kithara, executive vice-president of Nippon Telephone and Telegraph

Co. (NTT), Japan's domestic telecommunications carrier.

Kithara's paper, along with those of the other NTT officials who spoke at Telecom '83, provided a detailed picture of how Japan is preparing for the "advanced information society."

Although integration of presently separate data, voice, image and record services is one way of lowering the cost of those services and thus extending their reach, it is not enough, according to Kithara. Since 1977, he has been advocating a new scheme of charging for communications services based on the number of information bits transmitted rather than on the time of day or distance traversed.

At Telecom '83, Kithara said that

the new charging scheme will be a key element of Japan's new ISDN, which is known officially as the Information Network System (INS). Another key element will be "a new-generation computer" — one having "pattern recognition, voice synthesis, natural language processing and intelligent processing capabilities. Through the development of such computers we will... be able to provide automatic translation services, making it possible for future generations to communicate worldwide in their mother tongues."

However, it will take more than 10 years to develop the new computer, Kithara said.

In 1985, he added, Japan expects to begin providing voice/data services

through common, computer-controlled switching equipment. These facilities, along with digital local loops and digital intercity transmission links, will provide the hardware needed to build the commercial INS network.

"In September of last year, we started building a model INS system in the Musashino and Mitaka area, a Tokyo suburb," he said. This system, which will serve some 10,000 subscribers, is to be tested for about five years; during that time, it will offer a variety of interactive services including Captain, Japan's advanced videotext system.

Commercial INS service is scheduled to begin in 1985, said Kithara, and be available a year later in 10 major cities. By 1987, the company intends to have Japan's 60 largest cities interconnected.

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## Wideband Loops Called Significant

**GENEVA, Switzerland** — Wideband local loops will be the most significant part of Japan's Information Network System (INS), according to one of several papers presented by representatives of Nippon Telephone and Telegraph Co. (NTT) at the recent Telecom '83 here.

Only by putting high-bit rate transmission capacity on the user's doorstep can the full potential of the new network be realized, explained NTT engineers Nobuo Inoue and Kimito Tazaki in a paper titled "Steps to Enhance Telecommunications Networks Toward [an] Advanced Information Society."

Initially, subscribers will access INS through existing local loops, which, modified by black boxes at either end of the circuit, will be able to transmit digital information either simultaneously or alternately with analog voice signals. In the latter mode, two digital channels will be provided — one operating at 4K bit/sec, the other at 16K bit/sec — along with two 4K bit/sec channels for customer-network control signals.

In the "simultaneous" mode, digital data will be transmitted in a frequency band above the one used for analog voice, thus permitting both to operate at the same time.

The use of this "hybrid access" system reportedly will allow digital data to be transmitted at up to 16K bit/sec and possibly as high as 24K bit/sec.

Most of Japan's in-place local loops use paper insulation and will permit a digital signal to be transmitted only about three kilometers. In 1981, however, NTT began installing plastic-insulated loops, which reportedly extend the transmission distance to seven kilometers and enable the company to reach "virtually all" of its subscribers, the authors said.

"Optical-fiber systems will be the main vehicle for modernizing the local network," they added. The system Japan is planning will be able to carry analog and digital video, analog and digital voice and high- and low-speed data.

# Lonely Misfits or Budding Criminals? Hacker Debate Continues at Security Conference

By David Myers

CW New York Bureau  
NEW YORK — Conservative and liberal squared off in a dispute over hackers at the 10th Computer Security Conference here last week.

Seymour Papert, professor of mathematics and education at MIT and the inventor of the educational software language called Logo, defined hackers as social misfits who need to be given an opportunity to communicate their computer skills.

Donn B. Parker, senior management systems consultant at SRI International, countered that hackers are criminals — shoplifters, spies, even terrorists — who should be punished.

"I'm afraid some of them don't really understand that they are in violation of the law. When they see their fellow hackers are in fact going to juvenile hall for six months, maybe they'll wise up," Parker said.

Parker said hackers may start off as pranksters. He compared them to himself as a boy and to his young friends.

"We would tear down an abandoned barn for the sheer joy of being

destructive. But we knew we were breaking the law. I'm not sure hackers understand that," he said.

Prof. Papert, however, characterized hackers as skilled computer users who "manipulate the machine the way they are unable to manipulate people."

Hackers tend to be isolated and to work alone, Papert said. Hacking is often their only means of interacting with others, he pointed out.

The irony is that computers are designed to be linked together and the computer not part of a larger enterprise is "the extreme case," not the norm, Papert said. In their hacking, young computer whizzes betray

their desire to belong, he noted.

Papert inadvertently supported Paper in this when he quoted a message left on an electronic bulletin board for computer pirates: "The few people we can communicate with are our fellow hackers," someone had written.

But in general Parker took a harder view of the menace from hackers, saying that "when unauthorized people gain access" to a computer system, "the losses can be serious and they can be large."

The losses include destroyed software programs, tied-up access services, disclosure, or theft of data. (Continued on Page 18)

## IBM's Security Outlined at Meet

NEW YORK — Computer users and security specialists who attended the 10th Computer Security Conference here last week were treated to an inside view of IBM's security arrangements.

Dominic Stovola, senior security administrator at IBM, told an audience at the New York Penta Hotel that "setting up data security requirements must start at the very top of an organization and come down from there. It helps to get the chairman of the board involved if you can."

Stovola also warned against the "arbitrary split" between physical plant security and information protection and said a firm's computer center is "the wrong place" to locate responsibility for systems security.

"Typically, the computation center is not high enough up in an organization to provide executive-level protection," Stovola said.

What is more, since data processed in the DP department is available "outside the confines of the computer room," data protection ought to be centered somewhere outside the room, too, according to the IBM security chief.

Stovola urged appointment of a "staff catalyst" to put security plans into motion. Though the "staff catalyst" should not double as director of management information services for the firm, he should still "be intimately aware" of computer technology so he can recommend enhancements to the system where necessary, Stovola said.

Other suggestions Stovola made included establishing a partnership of every bit of information to someone within the organization, and giving every bit of information a dollar-and-cents value.

"It's a mistake to treat all information as if it had the same value, rather than selectively applying protection to data based on its worth to the organization," Stovola said.

Asked how to go about controlling management of the need for data security measures, Stovola replied, "The only way I know for sure is to have a major incident. They don't appreciate the value of the information they have until someone misuses it."

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# Computer Law Forum Addresses Software Piracy

By David Myers

CW New York Bureau

NEW YORK — Although legal experts are unanimous in agreeing that the U.S. Congress intended software to be protected by its Copyright Act of 1976, the problems of protecting software from pirates did not end with that act, lawyers attending the Computer Law Institute here recently were told.

Copyright lawyers and computer law experts addressing the three-day conference all said that U.S. law protects software programs from unauthorized copying and use. But they did not agree on the ramifications.

"All right, software is copyrightable. But how valuable is the copyright for protecting it?" asked Jon A.

Baumgarten, an attorney with the firm of Paskus, Gordon and Hyman in Washington, D.C. Baumgarten suggested that copyrights held by large vendors may raise antitrust questions.

For users, even the lowliest diskette is covered by a copyright, even if it carries no encircled C symbol, and companies that copy the diskette's programs without permission are breaking the law, noted Daniel T. Brooks, staff attorney with Computer Law Advisors in Springfield, Va. But memory chips and operating systems do not seem to be protected by copyright, Brooks told the conference attendees, of whom about 80% were lawyers representing vendors and around 20% were lawyers represent-

ing users.

Software is eligible for copyright protection in the first place because it is intended to communicate something. "Other programmers can, in fact, read what you have done," Brooks explained.

Michael S. Kepinger, a division chief in the U.S. Copyright Office, explained that a piece of work is thought to communicate something when it is "fixed in a form in which another human being can perceive it."

Under this definition, the fact that software programs can be reproduced is what brings them under the scope of the copyright laws, according to Kepinger. But he went on to warn that requirements for copy-

right protection differ depending on whether the software is licensed, distributed or sold over the counter.

An operating system, however, has been interpreted by the U.S. District Court as "enabling machines to work in tandem" and not communicating anything, Brooks pointed out. Therefore, it is not currently shielded by copyright law.

While the Copyright Office has taken the position that memory chips are "useful objects" and not eligible for copyright, it has also gone on record as saying that the drawings of the circuits burnt onto the chip, and even the chip masks, are indeed "original works" and can be copyrighted. But Baumgarten warned that recent court decisions suggested that copyright protection of a circuit layout does not necessarily provide you with protection of the circuit's function.

## Hacker Debate Still Brewing

(Continued from Page 17)

wholesale changes in stored information and time spent chasing down the intruders and locking them out, Parker said.

As for a cure to hacking, Professor Papert urged adoption of the goal of a computer for every child.

In a classroom full of computers, the hacker — a young expert — is solicited by the other children for help with their problems, Papert pointed out. Getting computers into the hands of his contemporaries will make the hacker feel wanted, he suggested.

"We now have in this country one computer for every 150 children. That's not enough to make a difference in anyone's life. To be competitive in the 21st century, we can't afford not to do this. But that's only the economic side. We can't afford it morally either," Papert said, warning that an uneven distribution of computers could divide the U.S. into classes of haves and have-nots.

'Change Their Values'

Parker agreed that "somehow we have to change the values of these kids" and "turn valuable kids around." But for the most part his solutions to the hacking problem were more straightforward.

Cut down the number of prompts that a caller into a dial-up access system receives on his screen, he urged. Investigate automatic dial-back devices for use with prescheduled telephone numbers, he added.

"You may want to design a trap in your system to lure [the hacker] into an attractive but limited area and keep him on-line long enough for the authorities to find out who he is," Parker said. He also recommended that DP managers know the names of their police department and FBI contacts in the event of a system break-in.

One solution Parker said he does not favor is hiring the successful hackers. "We have to let them know they are not heroes. Anyone who hires a malicious hacker deserves anything that happens to him."



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## Consider Maintenance, Tests, Timetables More Seen to Contracts Than Price, Delivery

By David Myers

**NEW YORK** — In negotiating contracts with vendors for large-scale purchases of computer systems, users should pay as much attention to maintenance clauses, acceptance tests and project timetables as they do to price and delivery.

That is what computer law experts told staff attorneys from both vendor and user companies who attended the Computer Law Institute here recently, a continuing education seminar offered by the Practising Law Institute.

"Organizations focus too exclusively on delivery, on that point in time at which the machinery is delivered. There are other considerations that are just as important," said Richard L. Bernacchi, a lawyer with the Los Angeles firm of Irell and Manella.

Focusing on the equipment's price to the exclusion of its maintenance costs is dangerously shortsighted especially when upkeep averages between 10% and 15% of a system's bill each year, according to Charles E. Harris, a Florida attorney and editor of the computer law newsletter "CNRReport."

### Consider Maintenance Early

Maintenance needs in particular must be considered from the very beginning of contract negotiations, Harris said.

"If you wait, you will run into the vendor's 'Oh, by the way' attitude. 'Oh, by the way, now that we have a contract, we need a maintenance agreement — here it is.' At that point, you face, to put it mildly, very reduced negotiating leverage. The salesman has his commission; the vendor has the contract, and if you don't like the maintenance that is proposed, fine, you provide it," Harris said.

Users shopping for a new system must pay as much attention to maintenance provisions as to performance characteristics in judging a vendor's goods, Harris added.

Bernacchi urged users to negotiate long-term maintenance agreements. "More and more vendors are terminating maintenance, especially on operating software, if there's a clause permitting them to do so," he pointed out.

If a vendor is unwilling to commit himself to long-term maintenance on his product, "you'll find out why," Bernacchi warned. Usually it means the vendor is on the edge of developing something newer and more competitive but doesn't want to tip off the unwary user, he said.

In judging the results of a system's acceptance tests, pay as close attention to reliability as to sheer performance, Harris cautioned.

"Focus on both the frequency of down-time problems and their duration. They may last just a few minutes but occur quite often," he pointed out.

Both Harris and Bernacchi warned against leaning too heavily on the results of benchmark tests.

"Benchmark tests can be remarkably good marketing ploys and re-

markably poor performance gauges if compatibility is not taken into account," Harris said.

Other things to think about in a major systems purchase, Bernacchi said, are:

- Whether the system is being chosen because it is cheap or because it consists of what the corporate organization needs.

- Whether it can provide the business results desired, not in terms of "bits and bytes and the other gobbledyook you see floating around the industry," but in terms the executives "who are going to have to live with it" can understand.

- Whether the system can be up-

and running and starting to accomplish those results when management needs them.

- And whether the system, from acceptance testing to annual maintenance, fits into the corporation's DP budget.

Harris added that a vendor's maintenance personnel and consulting services ought to be judged along with its equipment.

### Timetable Enforces Deadlines

To make sure that the system meets its deadline, Bernacchi proposed drawing up a project timetable as part of the contract between user and vendor.

The advantage of an agreed-upon timetable, he said, is that it clearly defines the responsibilities on both sides of the negotiating table, prevents later finger pointing in the event of a disaster and promotes frank relations between user and vendor.

Perhaps the most important thing for the user is the correct negotiating attitude, according to Bernacchi. And he caught that attitude in a negotiating table statement: "There are certain basic things we want from you, or we simply won't do business with you." That's a very effective argument in contract talks, he concluded.

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# What to Look for in a DP Manager

**Q** During the last three years we have had two directors of the DP department. As director of personnel, I am responsible for recruiting for all department head positions.

I hired both DP directors and relied heavily on input from people in the DP department in my final evaluation of candidates. As a result, the overriding criteria became technical capability. Neither of the people hired has lived up to our expectations, and we are currently searching for a replacement.

We have learned our lesson, and this time we hope to look past technical capabilities and hire someone with the potential to move our department forward in computer ap-

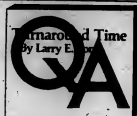
plications. Could you give us a personality profile of a successful DP manager?

**A** The successful director of an information services function commands the technical respect of his peers in management information systems, sets a good example in attitude and work, is committed to excellence (within the constraints of reality), is committed to the corporate good, downplays the "mystique" of computers, has a commanding presence and is comfortable in a peer relationship with top management, is innovative and generates a continuous string of ideas, is not afraid to make and stand behind a decision, is willing to get involved

in risky projects and is genuinely concerned about the welfare of workers within his realm of responsibility.

**Q** After receiving my Ph.D. in economics, I took a faculty position at a major university's school of business. I spent seven years in the economics department. Five years ago I took an interest in computers, transferred to the management department and began teaching courses in information systems.

We now have three professors with computer or information systems specialties and authorization to hire three more. We are having trouble attracting qualified people



because the deans and the department chairs are reluctant to recognize information systems as other than a support function.

On numerous occasions we have approached the administration about consolidating information systems education into a separate department. They say that their primary concern is to strengthen the traditional areas. Do you have any wisdom that I can use to counter this position?

**A** I question their wisdom. To maintain the attitude that information systems is a support function in a school of business is a step backward. Smart business school administrators are paying a great deal of attention to the ordered growth of an information systems program. They recognize that a progressive information systems program is the best way to strengthen traditional curricula.

You may be aboard a sinking ship. If you do not detect a radical change in attitude by the end of the semester, I would suggest that you take a position elsewhere. There are plenty of openings.

**Q** I am a senior systems analyst with over 16 years in data processing. Over the years I have designed and implemented several systems for the IBM System/3 and IBM System/34. Can you tell me the best method to market these systems?

**A** I can't conceive of a more risky entrepreneurial venture than an individual entering the market for proprietary software aimed at well-established hardware. If your planned product orientation is along the lines of standard systems, I am reluctant to offer much encouragement.

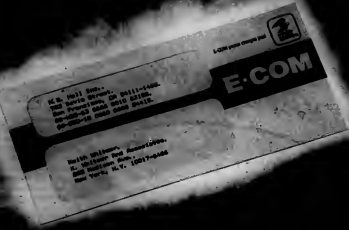
However, if you have a unique product that is state-of-the-art and noticeably superior to the existing alternatives, then opportunity does exist.

Unless you have plenty of seed money and finely tuned marketing skills, I would recommend that you first try to sell your products to an established hardware or software vendor. Such an establishment will have the distribution network and sales force needed to market your product successfully.

You will increase the probability of success if you designed a product that uses the full potential of recently introduced hardware.

Long is a professor at Lehigh University, a DP consultant and author. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.

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## Generally Satisfied With Performance Most Senior Accountants Found Using Micros

By Peter Bartolik,

CW Staff

NEW YORK — The majority of senior management accountants use microcomputers in their daily business activities and are generally satisfied with equipment performance, a survey recently conducted by the National Association of Accountants (NAA) found.

According to NAA research associate Suzanne Connor, "Senior managers now indicate they have hands-on experience, [and] they're becoming dependent on the microcomputers in much the same way as [they are on] calculators."

The NAA mailed questionnaires to a sample of its 95,000 members and pro-

cessed 700 responses from senior management personnel, a majority of whom are controllers and treasurers. Those responding were employed in nonmanufacturing firms, service industries and the financial industries; respondents also included consultants employed in a wide range of industries.

Almost 60% of the respon-

dents, 414 out of 700, said they or their staffs use microcomputers to perform daily activities. And nearly half of the respondents (321) said they personally use microcomputers in their daily activities.

Microcomputer use was indicated by more than 50% of respondents from companies with annual earnings in

the \$10 million and under and \$30 million and over ranges, while usage was less than 50% in the \$10 million to \$29.9 million range.

Of the five respondents with more than 500 people in their departments, only one said microcomputers were used by that respondent's staff. But use increased to almost 60% in departments employing less than 25 people; 580 of the 700 total respondents work in departments of that size.

### General Satisfaction

General satisfaction with systems was reported by 368 of the 414 respondents with micros in the office, but 170 also said they had been dissatisfied with particular aspects, ranging from memory limitations to slow speed.

In the offices in which there presently are no microcomputers, 33.7% of the respondents (or 13% of the total survey) indicated one or more units will be purchased in the next 12 months.

IBM's was the most frequently used computer, indicated by 32% of the respondents with micros in their offices. Apple Computer, Inc. units came in second with almost 23%. Epson America, Inc. apparently was most favored as supplier of printers, with 10% of respondents indicating the use of Epson units. Only 4% of respondents indicated the use of hard disk or Winchester storage, while 21% indicated they relied on floppy disks.

Spreadsheets were the most popular applications software package, being used in 82.4% of the departments with microcomputers. Word processing was the second most popular package, with 66.9% of the departments with micros using such applications. In most areas, the respondents indicated that applications programs were purchased. In particular areas, such as budgeting and financial analysis, respondents reported more packages were written in-house than were purchased.

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## Securities Center: A Case Study in DP Conversion

NEW YORK — When Denmark's bond trading industry made the switch over a single weekend from a paper-based system to one that is completely electronic, there was no opportunity to look back.

Since then, VP-Centralen, the Danish securities center that was established to handle the conversion, has become a case study, its vice-president, Henrik Dines Hansen, said in a recent interview here.

"We abolished everything about the old system virtually overnight. We were con-

ducting business the Monday after the Easter holiday and we have increased our transaction productivity by 20%," Hansen said.

The center could not perform a parallel conversion test because the information all had to be converted at the same time. "There was no turning back. We had to go with it and not look back."

Fortunately for Hansen and VP-Centralen, there was no need to "turn back," and he subsequently decided to publish a chronicle of the successful conversion in a book called *Up and Running*,

which will soon be released by Youdon Press here. "Youdon, Inc." had helped in the consulting stage of the project, and they thought it would make a good story," Hansen said. "I actually had the manuscript ready before the conversion went off — I knew I was going to be successful — and I just had to add a few pages."

Asked if he thought it was ironic for Denmark — whose money supply is tight and, on a global scale, small — to be taking this leap into the future with a totally electronic bond trading system, Hansen replied, "The less money you have, the more you need to move it fast. This is the challenge for countries like Denmark and Sweden. You have to be very efficient with whatever you have."

Hansen maintained that the world is closer than it realizes to becoming a paperless society and predicted that Denmark will soon electronically automate its system of stock trading. He also

thinks Norway and Sweden will be interested in what Denmark has achieved at VP-Centralen.

"Sweden had to shut down their trading during the market boom last spring. They couldn't cope with the paperwork. They couldn't settle, so they had to stop doing business for a week."

Hansen anticipated that in automating finance around the world, more software

products are coming along like Intel Corp.'s Intel Data Base Information System (Idis), a multiuser mainframe-to-micro link that acts as a buffer in the Danish system. "You need products like Idis to help solve the data anarchy problem: global processing and maintenance vs. individual information processing needs. That's the only way to deal with application backlogs."



VP-Centralen, the Danish Securities Center



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# Denmark First to Shred Paper Securities for EFT

By Susan Blakeney

**NEW YORK** — Paper securities are a thing of the past in Denmark, which has become the first country in the world to replace them with electronic funds transfer (EFT).

During a recent visit to the U.S., where he hopes to convince American banks to follow suit, the man behind the new system outlined how an entire country moved from shuffling manual securities to EFT. Henrik Dines Hansen, vice-president of VP-Centralen, the Danish securities center, provided the details of a system that was converted to EFT on April 1 and has been operating successfully since then.

Denmark converted its paper securities to an electronic system in order to stop the flood of paperwork associated with issuing and trading bonds. "Because of Denmark's highly complex mortgage credit system, which finances private homes, bond trade exceeds \$80 billion dollars, or 1.5 times the country's [gross national product]... the amount of paper transactions that was involved was staggering," Hansen said.

Recognizing this problem in 1975, Denmark's Ministry of Housing appointed a commission to propose alternatives to the paper securities system. Hansen, who had previously worked in a data center owned by some Danish banks, became project adviser for the commission.

The group recommended the creation of a national DP securities center, which would eventually become VP-Centralen, and Hansen was chosen to direct the standards and methodologies for system development of the center. Hansen's strategy comprised a three-pronged, 10-month analysis leading to his decision to pick software first and then determine the most appropriate hardware configuration.

Hansen first conducted a technical comparison of five data base management systems (DBMS), including Sperry Corp.'s DBMS 1100, Software AG's Adabas, IBM's IMS, Citicomp Systems, Inc.'s Total and Intel Corp.'s System 2000. During the second phase, he evaluated the level of support offered by the software vendors.

"There were three finalists that we thought could do the job, but we thought Intel's potential was the strongest. We wanted a vendor that could accommodate us and provide service five years down the road," Hansen said.

The final planning phase involved testing the DBMS using a full-scale model of the future application. IBM had just released its 4300 mainframe, which worked well with VP-Centralen's mock-up of the system, according to Hansen. During this phase, the decision to go with System 2000 was confirmed.

It was not until May 1980 that the Danish Parliament formally authorized the creation of VP-Centralen — some five years after its foundation had been laid — and Hansen was appointed vice-president. The data center was to serve only as a repository of information, Hansen explained, funded by Denmark's commercial banks, savings institutions, brokerage firms, mortgage credit institutions

and the Federal Reserve Bank.

The decision to burn all Danish paper securities in favor of the new system was announced by VP-Centralen two years ago at a conference held by the Association of System 2000 Users for Technical Exchange (CW, March 30, 1981). The projected conversion was to be completed this year, after "intensive and meticulous planning, the conversion occurred precisely on schedule and without a single software bug," Hansen claimed.

According to Hansen, the System 2000 DBMS, which runs on the center's three IBM 4341 Group 2 mainframes, has made for a smooth transition.

"Investors can obtain their securi-

ties in the same way they always did — from their banks or credit unions — but instead of receiving paper bonds, they simply receive statements from the banks of all their transactions. These cannot be used as legal tender," he added.

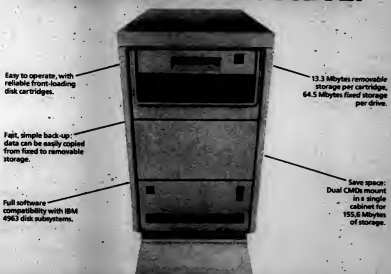
All transactions are registered on an account in VP-Centralen's data files, and the transfer of securities becomes valid only by registering the transaction in the computer.

Because 95% of the paper bonds were already on a DP system in either a Danish bank or credit house, the 1,500 end users of the new system only had to extend their existing communications networks within the financial sector to include VP-Centralen's data center.



On Photo by S. Blakeney  
H.D. Hansen

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# Chinese Engineer Outlines China's DP Strategy

BALTIMORE — While the Chinese computer industry is producing a wide range of fourth-generation computer products, there is still a vast development potential in the People's Republic.

So said Yang Tian-xing, the deputy chief engineer of the North China Computer Technology Institute, during a presentation on "Computing in China" that he delivered at the recent Data Pro-

cessing Management Association Conference here.

The computer industry in China is largely directed by two government bodies, the Electronics Industry Ministry and the Machinery Industry Ministry. A number of specialized research institutes, such as the Beijing Computer Technology Institute, and academic research centers also contribute to the advancement of computer

science. "They are all devoted to the development, production and application of computers," Yang explained.

Yang admitted that the utilization of computer equipment in China is still sparse. He compared China's installed base to that of Spain, which ranks 12th in the world.

China imports most of its computer technology from the U.S. (37%), Japan (30%),

France (9%), West Germany (8%), the Soviet Union and East European countries (6%) and the UK (3%). The remainder of equipment comes from a smattering of other European countries.

Unlike the West — where transaction processing often accounts for 75% to 80% of computer activity — China uses computers primarily for scientific applications (29%), Yang reported. Transaction

processing accounts for only 2% of their use.

## Main Obstacle

One of China's main obstacles in catching up with Japan and the West is the development of efficient Chinese-character information processing systems. Yang noted that China uses as many as 50,000 complex Chinese characters and another 20,000 simplified ones; this presents unique problems in terms of encoding, data compression and lengthy I/O efforts. Advances are being made, nonetheless, to overcome these obstacles, Yang maintained.

"Computing in China has undergone 30 years of development and achieved very great progress. The production system of the industry has been initially formed; the scientific research centers have been established and are being continually strengthened; and we now have a number of computer specialists of high academic level.

"If there had not been that decade-long setback, our achievements would have been greater. . . . Due to the unnecessary setbacks lasting from the mid-60s to the mid-70s, the number of professional personnel graduating from computer departments only amounted to about 30,000.

"Today the developing situation after China's economic transformation and the effective measure taken by the government to maintain further an open-door policy, have promoted the academic exchange between Chinese computer specialists and their foreign counterparts."

Specifically, Yang outlined the following future for China's computer industry:

- The state will greatly increase its investment in computer industry and enterprises.
- In three to five years, Chinese medium- and small-scale integrated circuits will greatly boost their output capacity while their costs go down.
- A viable Chinese software industry will evolve soon.
- Production will be stepped up in the areas of minicomputers and microcomputers.
- The open-door policy will facilitate the introduction into China of advanced technology from foreign countries.
- Advanced computer production lines will continue as will research and production on large-scale integrated circuits.



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# International Report

FROM THE CW INTERNATIONAL NEWS NETWORK

## BRAZIL

**SAO PAULO** — An agreement to develop jointly a superminicomputer has been reached here between IBM and Itaúca, an equipment manufacturer belonging to Brazil's Itaú Bank. Another agreement is said to be in the works that calls for the implementation of a network linking IBM mainframes to Brazilian banking terminals.

## FRANCE

**PARIS** — A joint marketing agreement was reached here last week by two of Europe's office machine superpowers, Carlo Olivetti, Inc. and CII-Alcatel. CII-Alcatel will sell Olivetti electronic typewriters, and the two companies will collaborate on a new company to develop a new generation of electronic typewriters featuring Zilog, Inc. Z80 microprocessors, micro floppy disks and electronic spreadsheets. In addition, Olivetti will market the CII-Alcatel videotex terminal.

**TOULOUSE** — A terrorist anti-computer group that calls itself the Committee for the Struggle Against Computers claimed credit for a fire that was set in Speyrer Corp.'s office here the night of Oct. 25. No one was in the systems office at the time of the fire, which the group said it set to protest the U.S. invasion of Grenada. In the last two years, the group has bombed offices of CII-Honeywell Bull, Philips Data Systems, Inc. and software vendor CAP Gemini.

## JAPAN

**TOKYO** — Hitachi Ltd. has installed its supercomputer, the high-speed array processor S-810 Model 20, at the University of Tokyo's Computer Center, which is used by all computer students at the university. The supercomputer features a main memory of 64M bytes and operates at speeds of 630M floating-point operations per second.

**TOKYO** — Toshiba Corp. has released an optical character recognition (OCR) system that is reportedly able to read 500 kinds of handwritten, Kanji and Kana characters in addition to printed Japanese words. The OCR-V595 system, according to Toshiba, will enable users to input data 60 times faster than with traditional keyboard input methods. Furthermore, the vendor predicted that the market for such devices is growing at an annual rate of 30%, and some 3,600 systems will be sold in 1983. The standard OCR-V595 system is priced at \$107,660 and will be available in December.

## SWITZERLAND

**GENEVA** — The French Postal Telephone & Telegraph Administration (PTT) took the wraps off Telecom 1 at the recent Telecom '83 Conference here. The satellite-based digital network service is expected to be operational sometime in 1984. Also on view was AT&T's videotex terminal called Sceptre, which will reportedly come in a microcomputer version with videotex capability and support European standards in the near future.

## UNITED STATES

**BOSTON** — During a recent "trade mission" to the U.S., the

Northern Ireland Partnership stopped here in an attempt to dispel its country's reputation for being a war zone and to promote high-technology business ventures there. The Belfast-based group, composed of business executives, bankers, trade unionists, academics, technologists and industrial development specialists; hailed its country as the "gateway to the European Common Market" and introduced a package of incentives for potential investors.

## WEST GERMANY

**MUNICH** — German participants at this year's IBM Users Group conference, held in Oxford, England, reportedly were unhappy with IBM's

plans to "stabilize" Virtual Storage Personal Computing (VS/PC), the concept that allows Personal Computer users to store information on IBM mainframes and do away with floppy disks. The IBM policy will, at the same time, force DP service centers to switch to alternative time-sharing environments such as IBM's TSO and VM/CMS, which calls for massive conversions of application software, critics said. In big installations, labor costs could run up to 45,000 man-hours because IBM has not come up with "usable conversion tools yet," according to one user. The user group's executive board plans to bring this problem before IBM Europe.

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## Message From EPS Keynotes:

# MIS Manager 'Must Become Agent of Change'

By John Giffant  
CW Staff

**BOSTON** — In a corporate environment marked by well-educated, highly aware end users, the information systems manager must become "an agent of change, an information czar" in order to survive.

That was the message delivered by Leslie Ball, professor of information systems at Babson College in Wellesley, Mass., in his keynote address to EPS, Inc.'s 1983 User Group Conference here last week. A frequent lecturer on information systems management, Ball said that management information systems (MIS) managers will have to focus on strategic plan-

ning rather than technical expertise to satisfy the demands of an increasingly sophisticated community of end users.

According to Ball, the MIS manager faces users who are highly educated and more familiar with the information resources that are, or should be, available to them. With the advent of micro, Ball said, those users are now spread through every level of the corporation, even to the carpeted confines of the chief executive officer.

Employees have become "knowledge workers" and demand more and better information to perform effectively. "The end users are now

better aware of trends and capabilities. The users want new tools, and they want them fast," Ball said. "They have an increased perception of the information systems services that they're getting, and they know when the MIS department is not doing its job."

But the MIS manager, faced with such economic constraints as high interest rates and the shortage of capital, must learn to "do more with less."

No longer, Ball said, can the DP staff easily justify programming cost overruns or the addition of more and more equipment. The MIS manager will have to learn to compete with

other executives for corporate funds.

All of this points to the importance of long-range, strategic planning by the MIS manager, Ball emphasized. "The MIS manager is faced with a moving target. He needs to be a strategic planner to keep ahead of needs, because those needs change so fast. He will have to manage strategy rather than hardware, and if he can't do that he won't survive. It's no longer so important to be technically knowledgeable — the most important skill today is management."

The implication, according to Ball, is that the MIS manager must "become political." The successful DP professional will combine the skill of managing a technical staff with the ability to understand the needs and responsibilities of end users to become a "manager of managers." And, to balance the need for service with the shortage of resources, the MIS manager must make users aware of the true cost of information services.

"He must achieve a high profile within the organization. He must be viewed as a leader and not simply as a technical person," Ball said. "It's imperative that he learn who's important within the company and how to get things done. To be successful, he must be seen as an agent of change, the gatekeeper and the information czar."

### New Responsibilities

Ball said the introduction of microcomputers clearly illustrated the new responsibilities MIS professionals must undertake. "When the personal computer was introduced, most MIS managers blew it badly. They were certain that these things were a fad, that they'd just go away. In the future, MIS managers have to take the lead in planning, not just react to change."

That strategic planning, Ball explained, will be necessary to coordinate the use of an increasingly wide variety of hardware and software products available to end users. More importantly, the MIS professional will need a sound strategy to manage what Ball labeled the "total-access world."

"We're moving to an environment where users demand access to all the information they want. That's a great opportunity to open the MIS world to them. But it also implies ethical and security problems. That area is one of both opportunities and problems that the MIS manager will have to address," Ball said.



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## Outdated System Costs Montana \$2.5 Million In Lost Taxes

JEFFERSON CITY, Mont. — An outdated computer system has cost the state of Montana between \$350,000 and \$2.5 million in uncollected state income taxes, the state auditor's office here has reported.

The amount is based on a discrepancy in taxes owed by individuals but not billed because the computer system is incapable of detecting those people, according to Ken MacNevin, public affairs officer for the state auditor's office.

"The system wasn't picking them up," MacNevin said, explaining, "When a taxpayer pays 80% of his tax liability throughout the year in withholding and installment payments, unless the tax payment meets one or more of the exceptions in the tax form, he gets an addition to his tax that's owed, a penalty for not paying enough of it on time. The individual income tax section has not established an alternative procedure for identifying these nonpayers."

According to MacNevin, the problem could be rectified by updating the Department of Revenue's technology, and the collection of tax dollars by the state could proceed more efficiently.

The problem reportedly lies in the computer program, which was developed in the mid-1970s and has only been revised to keep up with legislative changes in the tax laws. "We have not revised the system to keep up with modern technology," said Hal Hebert, manager of Tax Production Systems for the Division of Revenue Information Services Division. "We're working on that."

None of the systems in place for corporate income tax, individual income tax and employer withholding tax are less than five years old, MacNevin added.

"The corporate income tax system went in in 1967, the individual in 1973 and the employee withholding system in 1977. Of course if you're talking about a 1967 computer system, it's like talking about a 1994 Model A."

## French Group to Issue Smart Cards in 1984

PARIS — Intelmatique, the international marketing bureau of the French telecommunications industry, announced recently that 1½ million "smart" cards will be issued in 1984 by the Ministry of Post and Telecommunications.

The multiservice Smart Card is a plastic, credit card-size credit device containing one or more embedded programmable microcircuit chips with memory storage capabilities. Intelmatique said the cards will initially be used for public pay telephone service, payment for videotex services, decisions for pay television and payment for conferences and special events at permanent exhibition and conference sites.

The card will also reportedly be used by some savings account customers of two postal bank institutes.

## IAT to Beam Data Communications Forum

ROCKVILLE, Md. — The Control Data Institute for Advanced Technology (IAT) has announced the third edition of its Data Communications Update seminar, to be beamed by satellite to 10 cities on Dec. 5.

IAT data communications instructor Gary Zielke will conduct the seminar. The program will focus on current developments and standards and explore future trends in this rapidly changing field.

Topics will include local-area networks, the emerging technology of integrated voice and data, the impact of office automation on data communications and packet

switching services from Bell Laboratories as well as from competitors.

The seminar will be beamed to the following locations:

- From noon to 4 p.m. — Atlanta: Atlanta Marriott Northwest; Boston: Sheraton Mansfield Inn; New York: Sheraton LaGuardia; and Washington, D.C.: Twin Bridges Marriott.

- From 11 a.m. to 3 p.m. — Chicago: Sheraton International O'Hare; Houston: Houston Astro-dome Marriott; and Minneapolis: Bloomington Marriott.

- From 10 a.m. to 2 p.m. — Denver: Denver Marriott South-east.

- From 9 a.m. to 1 p.m. — Los Angeles: Los Angeles Marriott; and San Francisco: Sheraton at Fisherman's Wharf.

Registration is \$195 per person, if payment is received prior to the seminar. For every three participants from the same organization registering together, a fourth participant may register without charge.

If the institute has to bill registrants after the seminar, the fee is \$245 per person.

Additional information on the Data Communications Update seminar is available from IAT, located at 6003 Executive Blvd., Rockville, Md. 20852.



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# Manager's Role to Reflect Shift Computers Seen Moving to Industry Front Lines

By Jim Bartimo  
CW Staff

CHICAGO — Computers have moved from a support role to the front lines in areas including the banking and airline industries. This shift in the computer's role will change the way we look at data processing and the way we do business.

That was the message John Diebold delivered at the Integrated Office Technology Conference and Exposition held here recently. The chairman of the New York-based Diebold Group, Inc. gave a featured presentation on the corporate effort toward office systems integration.

"You must ask yourself what is the

role of automation in your business," he said. "Information technology is becoming a determinant of competitiveness."

## Communications Department

Among the changes brought about by the proliferation of computers is the increased role of the technical communications department. Diebold suggested that one scenario would be to combine data processing and communications into a single department. This would be helpful to the communications department because network design now requires a large staff, he said.

The role of the data processing

manager will also change. Once head of the "information factory," he will soon become a policymaker as more end users acquire desktop machines.

"It's changing from a wholesale activity to a retail activity," he said. Pointing to what he called "an analytical void when it comes to system integration," Diebold said the corporation must change its method of evaluating the computer. "We measure people and machines that are displaced rather than the time/value of the information," he noted.

Most of the changes coming into data processing and the business world start with the advent of the personal computer and microproces-

sor. Although the large computer has been in existence for about 30 years, it is only now that "we have a num-



GW Photo by J. Bartimo

"Information technology is becoming a determinant of competitiveness," John Diebold recently told a conference in Chicago.

ber of computer-literate people," Diebold said.

As consumers become more computer-literate and microprocessors creep into everything from home appliances to automobiles, some unexpected changes may take place. For instance, a home appliance with a resident microchip will be able to dial a service center when it breaks down, determine its own problem and the best method of repairing itself "without reference to the home owner," Diebold predicted.

## Info/Software Set for June 12 In Chicago

NEW YORK — Info/Software, a new, exclusively software exposition, will be held at Chicago's McCormick Place next June 12-14.

Exhibits at the show will cover applications and systems software for mainframes, minicomputers and microcomputers, with an emphasis on products for business, industry or institutions.

Software for games, homes and entertainment will not be permitted, according to a spokesman for the show's organizer, Clapp & Poliak, which also sponsors the annual Information Management Exposition & Conference (Info).

The creation of the show was spurred by the interest in the Software Center at Info, which was 60% larger in 1983 than the previous year, the spokesman said.

Pricing for admission to the exhibition floor are \$5 in advance and \$10 at the door. Pricing on conference registration will be available in December.

More information is available from Clapp & Poliak at 708 Third Ave., New York, N.Y. 10017.

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# Report Writer 'Travels' With User's Auditors

HOUSTON — Report writing against a data base is often complicated by the technical considerations involved in reading the data base as well as the scarcity of generalized report writing packages capable of interfacing with multiple data bases. But a Fortune 500 manufacturing company here is using a generalized data base interface to do the job.

Cooper Industries em-

ploy approximately 30,000 people, has annual sales of approximately \$2.3 billion and is made up of more than 15 independent divisions that manufacture a variety of products ranging from sensors to portable drilling rigs, from fiber-optic wire to jumper cables and from drapery rods and miniblinds to gas compression equipment.

The company's data processing functions are decen-

tralized. Each division works with the hardware, software and application systems that are best suited for its particular product line and customer base.

Any report writer selected to be used throughout the 15 divisions had to run on any IBM mainframe operating system and interface with both Cullinet Software, Inc.'s IDMS and Cincom Systems, Inc.'s Total data base man-

agement system. Partly because Carleton Corp.'s report writer Auditor met these criteria, it was selected in 1981 for use by Cooper's internal auditors.

"We were looking for a report writer that was easy to use and easy for a non-programmer to learn," said Robert Hevly, director of internal auditing, "and it was essential that the report writer be portable from division

to division, from system to system."

Before Cooper purchased the package, auditors relied on whatever report writers — if any — were installed within the individual divisions. As part of a plan to create an integrated auditing function, Cooper searched for a single report writer that could be used not only throughout the corporation, but also by all auditors, rather than just by DF auditors, a Cooper spokesman said.

Cooper spokesman Paul Cowley is particularly pleased with the package's portability. On field audits, the system is typically installed, and productive work is being accomplished on the morning the auditor arrives at the field location. Once the audit is complete, the system is "deinstalled," with the contents of the dictionary saved for possible use in future audits, Cowley said.

## Hidden From Users

Data base jargon is said to be hidden from end users because data bases are defined to the dictionary in much the same fashion as non-data-base files (both data base and non-data-base files consist of records and fields). To support the generalized data base interface, two additional entities are defined to the dictionary: record indexes (relating all records of the same type in a particular sequence) and record links (relating two or more different record types). All supported data base files are defined in this manner.

Cowley said that when he began to work with the IDMS data base, "the dictionary was set up by someone with very little knowledge of any data base, and it worked. I never thought it would be that easy." Shortly, Cowley will be working at a Cooper division using the Total data base management system, and he expects that the process will be equally simple.

Once a data base file has been defined to the dictionary, end users can code report requests using the same programming rules that are used for non-data-base files. There is never a need for the end user to be familiar with the calling protocols usually needed to access data base files; the system constructs these bases on the dictionary definition of the file and the system's knowledge of the supported data base management systems.

With the variety of report formats that can be produced and the flexibility of the programming language itself, the package has many features of a report writer, Cowley said.

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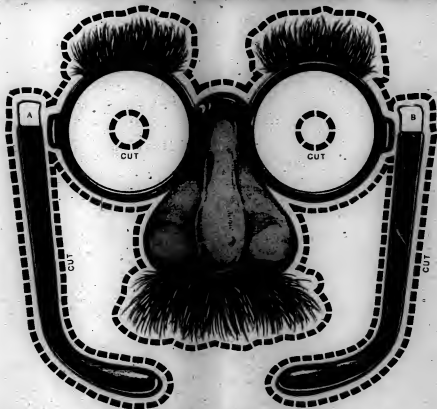
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\* Datapro "User Ratings of Proprietary Software-COMPUTE" November 1982; 2. *Computeworld*, December 20, 1982.

Other Offices: New York, Houston, Dallas, Los Angeles, San Francisco, Chicago, Philadelphia, Washington, D.C., Milwaukee, NJ, Bethesda, CT/Representatives: Canada, U.K., Europe, Australia, Japan, South Africa.

# Printers Handle Output From Different CPUs

CALGARY, Alberta — A Canadian company with diversified interests in insurance, property management and resort operations solved a hardware problem from a hard-copy angle by installing a switching system that allows two printers to handle output from both an IBM and a Digital Equipment Corp. processor.

"Our IBM 4341 was using two high-speed printers [IBM 3203 Model 5] — a very costly operation, especially since the output need was really equivalent only to about 1½ printers," explained Vi Sadler, director of computer services for the Cascade Group here. "At the same time, our two DEC PDP-11/70s, one of which we knew would be phased out within 12 months and the other

somewhat later, were functioning with two old 300 line/min printers, which were not operating at an efficient level."

Besides the IBM 4341 — soon to be upgraded to an IBM 3033 — Cascade's Computer Systems Division uses an IBM 4331. The two PDP-11/70s will be eliminated in favor of a distributed data processing system using PDP-11/44s this year.

Confronting its output problem, Cascade's DP operations staff consulted with Southern Systems-Canada in Willowdale, Ont., which provides users with printer systems compatible with most computer processors. Cascade decided to use two 1,100 line/min Southern Systems QT 1100 printers together with Southern

Systems' PS-10 switcher.

"The two Southern Systems printers take up far less space than the IBM 3203 printer," Sadler said. "The two actually fit into space that would be required for one IBM printer."

"The difficulty in achieving this versatility previously was that the electronic interfacing needs of the DEC and the IBM are so different that only very, very costly switching systems could have accomplished what the PS-10 does today, very inexpensively," added Steve Miller, vice-president of information systems for Cascade. "Having the two printers — switchable either to the DEC or the IBM — also gives us a backup output system should one have any downtime."

The Cascade Group companies include Family Life Insurance Co., Sovereign Life Insurance; Sovereign-General; Merritt Management Ltd., a property management firm; and the Panorama Ski Resort. "Our DP operations serve all those companies," Miller said.

"The biggest applications are the administration of the insurance policies in the life and casualty business. These are large systems running on IBM," he said.

"The DEC equipment has been used for most of our noninsurance needs — the reservation system for Panorama Ski Resort, as well as property management functions for Merritt, plus general ledger and accounts payable for all those companies."

Because Cascade has to support such a diversity of applications, "we require a diverse set of tools — the necessity for having both DEC and IBM. It's been very cost-effective for us to use the two Southern Systems printers on the three computers. The alternative would have been two printers for the IBM and two for the DEC — a costly solution."

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## 'Top Secret' Meet Set for Dec. 7-9

ORLANDO, Fla. — The first annual conference for users of CGA Computer Associates, Inc.'s Top Secret security package will be held at the Marriott Inn here Dec. 7-9 by the Top Secret International Committee.

Security consultant Jack Bologna will deliver the keynote address on how to sell access-control security to upper management. Workshop sessions will cover auditing facilities, password management, application protection, auditing MVS, technical support personnel and CICS considerations.

The registration fee for the conference is \$250 per person. Registration forms are available from CGA Computer Associates, 960 Holmdel Road, Holmdel, N.J. 07733.

## Users Guides List Service Organizations

PALMYRA, N.J. — The Service Research Group here has made available three user guides listing independent service companies, particularly those servicing personal computers.

The "Independent Service Directory" is said to cover 262 companies, with company name, address, telephone number and corporate officer.

The "Independent Service of the IBM Personal Computer" provides profiles of 25 independent services of IBM micros, including information on service features, service contract, average response time and geographic areas serviced.

The "Independent Service of Applications and Systems Software" includes profiles of 105 companies, including company data and annual and service revenues.

Priced at \$19.95 each, the reports are available from the Service Research Group through Box 335, Palmyra, N.J. 06065.



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# Paint Maker Finds Right Order, Invoicing Mix

PITTSBURGH — The problem was clear. PPG Industries Chemical Group needed to improve its order processing and invoicing (OPI) system, which linked its network of sales offices, distribution centers and manufacturing facilities across the country.

However, the original system, operating on the management information systems (MIS) department's twin IBM 3033 processors, was complicated. The system consisted of 825 programs and took more than 25 man-years to develop.

The OPI system did the job, but was becoming increasingly inefficient in light of PPG's growing requirements. In addition, applications development was slowed because the system required constant maintenance by the programming staff at PPG, one of the country's largest manufacturers of flat glass, industrial coatings, paint and strand fiberglass.

The solution involved rewriting the entire OPI system, using Cincom Systems, Inc.'s Mantis package. The package not only allowed the firm to rewrite the entire system in less than one year, but to do it with less than half the 150,000 lines of code in the original program. It also took only 5½ man-years to complete.

According to MIS manager Michael Crowley, the firm began its search for a solution to its software problem by forming a study team. The team began to explore applications development software to use in updating the OPI system—including the addition of on-line order entry capabilities. The team also wanted a package that would increase programmer productivity and reduce applications development time.

After reviewing 10 leading devel-

opment tools, the team eventually whittled the pool to three: Cincom Systems, Inc.'s Mantis package; Culinet Software, Inc.'s Adds-On-Line; and IBM's Development Management System.

## System Brought Up in One Day

"We were able to bring the system up in one day, despite the size of the OPI system," explained Tony Liberoni, manager of the firm's operations and systems. "We had contingency plans in case the system came down, but we didn't have to implement them because Mantis gave us the ability to correct bugs almost immediately after we discovered them."

When a customer order is entered into the renovated OPI structure, the

system determines the manufacturing facility closest to the order destination, assigns a shipping date and selects appropriate routings and transportation. The system also generates the necessary paperwork, including invoices and bills of lading. Because shipping notices can be printed at any manufacturing facility within minutes of order entry, rush orders can be handled easily.

According to Crowley, the Mantis package has also increased programmer productivity by as much as 35%. The new OPI system has also reduced the drain on Crowley's programming staff, allowing programmers to devote an average of 80% of their time to application development and the rest of the time to pro-

gram maintenance.

The OPI project is only the first step in a major overhaul that the PPG Chemical Group's MIS department has planned. Crowley said that some manufacturing sites are operating antiquated batch systems which often require the full-time attention of an analyst just to keep them functioning.

The programming staff, as a result, has begun updating the company's base of manufacturing support applications, such as storehouse inventory control, wage and payroll, purchasing, accounts payable and maintenance management.

"Using Mantis, we will update each system as an integrated, data base-oriented system," Crowley said.

# Apollo recognizes the fact that there are two sides to every professional.

## Guide Helps Banks Develop Micro Programs

ATLANTA — Computer Based Solutions, Inc. (CBSI) has announced the publication of *Micros in Banking*, said to be a complete guide for banks, savings and loans and thrift institutions to use in the development or improvement of microcomputer programs.

In addition to 22 case studies, an overview of trends and a listing of 20 software firms, the book includes chapters on the following topics:

- Sorting out the facts and myths about micros.
- To write or buy software.
- How to buy the right brand of hardware.
- The micro's proper place in banking.
- Micros as transactional processors.
- Micros as analytical instruments.
- The people-micro relationship.
- Budgets and costs.
- Data security.
- How to buy asset and liability management software.

The book can be purchased for \$75. CBSI is located at Suite 1148, 3390 Peachtree Road N.E., Atlanta, Ga. 30326.

There's a part of a professional that involves their profession.



Then there's the part that goes to meetings, makes presentations, does budget, prepares documents.



Data Ten, Inc. President Ed Allen (standing) discusses a system inventory update with Bill Palmer, the service bureau's telecommunications analyst.

## Bureau Clients Get Features Of Personal Computers With Terminal-CPU Link

IRVINE, Calif. — Top management at Data Ten, Inc. has found a way to provide the computer service bureau's customers with the operating features of a desktop personal computer — but without the personal computer.

Instead, Data Ten customers can link a remote terminal to the service bureau's central IBM computer and use it as if it were a personal computer. The equipment cost is a few hundred dollars for a terminal and modem, and the "personal computer" customers have greater storage ca-

pacity available and a wider variety of peripheral devices to call upon.

"The key is that we've used existing software to provide a relational data base that lets the mainframe computer look exactly like a user-friendly personal computer," explained Edward D. Allen, president of Data Ten, which serves Orange County, Calif. "Users log on their terminals, build their screens, allocate their disk file space, do their data entry and then generate whatever reports they need from that data."

The primary CPU is a 684-bit IBM 370/158-3, whose peripheral equipment includes three high-speed line printers and a laser printer; 40 IBM 3330 disk drives; eight tape drives; 32 IBM 3270-compatible terminals for in-house use; and a card reader/punch. Teleprocessing capabilities include an IBM 3705 equivalent front-end processor with low-speed asynchronous dial-up support, bit-synchronous high-speed line support for both remote job entry and time-sharing operation and Systems Network Architecture capabilities for other devices.

The mainframe operates under the OS/VS2 MVS/SP operating system with a variety of user features for multiple console support, teleprocessing, time-sharing, remote job entry and multiple file-access methods, Allen said.

### Internal Applications

Data Ten added the PNMS-II network management software package from Peregrine Systems, Inc. of Irvine, Calif., in early 1983 to maintain its own equipment inventory and manage problems relative to the network. As Data Ten's staff became more familiar with PNMS-II, it began to use the package to develop internal applications including computer housekeeping tasks, related accounting subroutines and electronic mail.

PNMS-II is also used in Data Ten's personal computer user approach. It was originally intended to maintain the network inventory and present management information in reports. It provided files, screen formats and relationships between files that are all user-defined without programmer assistance, Allen said.

PNMS-II includes a relational data base system, a problem management facility and a report writer facility. The problem management facility is used by Data Ten customers for data entry and specification of information relationships. The data base is the collection point for all user files. The report writer permits extraction of data from any files.

The problem management facility allows users to define any number of categories and lay out screen formats for them, Allen noted. The screen format utility defines screens exactly as they will appear. Horizontal and columnar data fields can be used in the same format.

All popular data types are supported. (Continued on Page 42)

According to recent reports, people who work with computers spend some 30% of their day working in their chosen profession. And 70% of their day just getting things done.

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\*VAX is a trademark of Digital Equipment Corporation.

# Remote Terminal-CPU Link Simulates Micro

(Continued from Page 41)  
ported, and field attributes may even be color coded on color terminals. Format changes do not invalidate existing data. A "fill" function fills records with the required information from the data base, as defined by the user in the link file. A "find" function displays information directly from a record, again according to user definition in the link file.

The data base contains the information necessary for management of a network. Users may define any number of files to access information by keyword. The data base structure, relationships and screen formats are all defined by the user.

Query-by-example access to records and files is provided by comparison operators. The Fill and Find functions provide interfile reference

capabilities. Any number of key fields may be supported in each record.

A variety of common data base maintenance functions is also provided, Allen noted. System flow and relationships are also defined without programmer assistance, using the link and menu files.

The report writer lets users define and run reports on any aspect of the data base,

Allen said. Reports can be created using data from any number of files, with the system prompting the user through the definition of the report. The report writer may also be used to perform mass updates of the data base.

Other utilities handle system security, message communications between users, a conversion facility that converts files from other sys-

tems to the FNMS-II format, a status function that displays all current users and a Journal that records all system activity with data, time and operator identification.

"The data base is structured in such a way that the casual user can set up his system without any programming restrictions or being an experienced programmer," Allen said. "The user can sit down at his terminal or personal computer and develop his own program in a matter of 15 to 30 minutes."

In addition, he noted, the user can go back in and make changes in his program without losing all the data he has already keyed in. "The integrity of the information remains, even though new records or fields may be developed. It can be reformatted to the new screen layout without redoing data entry or using a conversion program."

FNMS-II users may employ existing personal computers as remote terminals in a 3270 emulation mode to communicate with the mainframe. "In fact, the data base and our Megacalc spreadsheet program (from The Mega Group, Inc.) let personal computer users load their own programs into our mainframe and continue to use them," Allen said.

## Data Sharing Easier

Communications and data sharing are easier because the mainframe "personal computer" can support up to 32 users per site. To maintain communications between remote personal computers or terminals and the central computer, Data Ten has installed protocol converters to take the Ascl asynchronous data coming in from the personal computer and convert it to the 3270 mode.

Mainframe computers were structured as transaction-driven data base with a batch orientation. These traditional designs have been modified in recent years to be interactive, but the resulting data bases have not been relational.

"The personal computer has changed all of that," Allen said. "The personal computer creates keys and pointers at the time the data is entered, so whenever data is to be retrieved, the personal computer simply goes through the same calculation to come up with the data address. Personal computers are fast in cycle time so they execute well. But they don't support large data bases because their off-line storage is limited. So this new partnership of personal computers and large CPUs gives users the best of both."

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# UW Library Testing On-Line Card Catalog

**MADISON** — Few students at the University of Wisconsin's Madison campus relish the thought of a close encounter with the card catalog at the university's Memorial Library.

Confronted by drawer upon drawer of file cards containing listings for the library's 4.5 million books, students often complain that finding resource materials is by far the toughest assign-

ment of any research project. But the university has taken the first step toward a computerized cataloging system that will someday make today's cards and drawers obsolete.

Currently in the testing stage at UW-Madison's smaller College Library in Helen C. White Hall, the new system promises to make searches for materials easier and quicker.

Students with just a vague idea of a subject heading or only part of a book title will be able to conduct a fast search using the computer, predicts Donna Senzig, acting director of College Library, which serves mainly undergraduate students.

According to Senzig, the computer will even tell the student whether the book is on the shelves or out on loan. Installed in late June, the

College Library system contains listings for the 40,000 titles available at that library. Seven IBM 3101 terminals access information on a data base residing on the university's IBM Series/1 minicomputer.

Expansion of the system to handle 400,000 of the volumes at the larger Memorial Library is expected next spring, but is dependent upon approval of funds by

the state legislature, Senzig said.

She hopes that 50 computer terminals will be available at Memorial Library next year.

## Terminals at Branches

Eventually, terminals will be available at all 22 major campus libraries, departmental offices and dormitories, making trips to the main libraries unnecessary.

"In a time of budgetary constraints, the system will provide a better way of providing service without increasing staff," Senzig said.

The "Online Catalog," as it is called, will bring important changes for both researchers and librarians, said Frank Bright, director of technical services at Memorial Library.

According to Bright, efficiency will be improved for librarians as well. He estimates that as many as 200,000 cards may be misfiled in the Memorial Library card catalog, making these books inaccessible both to librarians and researchers. "This is one of the most important things libraries must do over the next decade to meet the needs of scholars," Bright said.

## Card Catalogs Out

"Card catalogs are on the way out. They've grown too large, complex and costly, and there are too many inconsistencies in them," he said.

Bright predicted that electronic cataloging will eventually eliminate most of those problems. But two familiar problems — time and money — will make the switch-over to computer cataloging a years-long process. Aside from the obvious cost of providing mainframe computers and access terminals, the university must also deal with the problem of cataloging millions of volumes that were filed on cards under outdated systems, Bright noted.

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## Handles Variety of Applications

# Petroleum Firm Strikes Oil With Local Net

DALLAS — The nation may depend on oil, but the people who search for oil depend on information.

"The lifeblood of an oil exploration firm is land to drill on," explained Joe Lears, data processing manager for Lear Petroleum Corp., based here. "You have to keep track of the leases under your company's control."

When Lear Petroleum's accounting work load began to skyrocket, its DP department had to keep up, even though the work load increased by a factor of 20 between 1977 and 1983. The firm's business grew from \$17 million to \$200 million.

Lear Petroleum is an oil and gas exploration and gas transporting firm. Prior to 1977, the firm — which employs 350 people in Oklahoma, Texas, Louisiana and Montana — subscribed to a computer service bureau.

"We wanted applications developed specifically for Lear, but the service bureau couldn't provide that," recalled John Winslow, Lear Petroleum's vice-president for management information systems. "In shopping for our own computer, we were looking for systems that were user-friendly — we didn't want a data processing staff that would get between the system and the user."

Lear Petroleum bought in 1977 a Datapoint Corp. 6600 processor configured as a Datashare system with three attached terminals and 20M bytes of disk storage. The 6600 is a minicomputer that fits easily on a desktop, according to Datapoint. Lear Petroleum ordered one with the maximum internal memory possible — 256K bytes.

Datashare is the multiuser version of Databus, the Datapoint programming language. Up to 24 terminals running different Databus programs simultaneously can be attached to a 6600 processor.

"Not only did we grow transactionally — by the amount of accounting work we had to do — but we also grew by the number of applications we had running on the computers," Winslow said. "We needed to add about one terminal every month or so."

Initially, Lear Petroleum began running four applications — lease records, general ledger, revenue distribution and joint-interest billing. Progress, however, didn't stop there, and soon the company reached a point at which more processors were necessary.

Lear Petroleum expanded to a Datapoint Attached Re-

source Computer (ARC) local-area network in 1979 with the addition of two 6600s. One 6600 acted as a "file processor," handling the network's disk storage, and the other two acted as Datashare processors.

### Network of Processors

Lear Petroleum now has a network of Datapoint proces-

sors at its headquarters, and smaller networks have been installed at three divisional offices. Seventeen of the processors are 6600s; another 17 are 3800s; and seven are 8600s. The 3800s and the 8600s are large-screen processors suitable for word processing.

Five of the 6600s are file processors, supporting a total

of 740M bytes of storage. Another five are used for Datashare, supporting a total of 38 terminals. Other network resources include four letter-quality printers, three high-speed belt printers and two 160 char./sec. dot matrix printers.

Lear Petroleum now runs more than 60 application software systems on the ARC

network, ranging from payroll accounting to natural-gas purchasing. The programs are written by a software consulting firm that Lear Petroleum owns. When the programmers aren't working for Lear Petroleum, they're available to work for some other company. On the average, about 15 people

(Continued on Page 46)

# The promise fulfilled.



## NEAX 2400 IMS

## Conference to Highlight Micros

PALM SPRINGS, Calif. — Enterprise Information System, Inc.'s fall conference focusing on the use of personal computers and developments in microcomputer software will be held Nov. 21-22 at the Americana Canyon Hotel here.

Among the featured speakers at the conference will be Esther Dyson, president of Rosen Research, Inc., whose keynote address will highlight "Critical Factors for Success in the Personal Computer Arena."

IBM Director Robert Berland will present an overview of application software

developments and end-user trends, and Ralph Ungermann, president of Ungermann-Bear, Inc., will discuss local-area networking for large organizations.

According to the sponsor, the conference will highlight the growing use of microcomputers and the implications of that trend for users, vendors, OEMs and retailers.

The cost to attend the fall conference is \$850.

Enterprise Information System can be reached through P.O. Box 1154, Greenwich, Conn. 06836.

## Local-Area Net Keeps Track Of Oil Firm's Land Leases

(Continued from Page 45)  
work on software for Lear Petroleum at any one time. However, Lear has only one full-time DP staff member.

"With every application we do, the first thing we think about is how the user can do this for himself. All data entry, all file updating and 60% of the processing is done by the users," Winslow said. The DP staff performs

overnight batch jobs, plus file backups and other "housekeeping" chores.

Divisional offices in Denver, Oklahoma City, Okla., and Houston have been equipped with ARC networks. "The systems at the divisional offices are used for regular accounting and for tracking the number of undeveloped leases under Lear's control," Lanier explained.

The divisional ARC networks are on-line with headquarters via phone lines using a Datapoint software package called ArcLink. This gives all users transparent access to the files stored in the headquarters ARC network — except, of course, that the data is transferred at 9,600 bit/sec instead of 2.5M bit/sec. A processor at each end of the communications link must be dedicated as a "communications processor."

Word processing is done through Datapoint's Integrated Electronic Office Station software, which turns the 8600 or 3800 into a WP station. Mathematical modeling is done with Microsoft, Inc.'s Multiplan, a spreadsheet simulator.

"Multiplan has proven very valuable," Winslow said. "It's used a great deal by top management."

"The direction I want to go in is toward tying a number cruncher or mainframe to the ARC network — to be a slave of the network, not the other way around," Winslow said.

## Group Formed For CLS Users

JACKSONVILLE, Fla. — TCS Software, Inc. has announced the formation of the first TCS Client Ledger System (CLS) Users Group. The organization was established to provide CLS users with details on the features and benefits of the package, to answer questions and to establish a source of information on CLS capabilities.

The chairman of the group, Robert T. Hood, is an accountant who has used the package for two years. Hood is interested in talking about problems, solutions and desires for the future with other CLS users.

The group's first meeting was held in late October. Participants included Fred Martin, author of CLS, and Tom Lytle, a CLS specialist.

More information on the organization is available from the CLS Users Group, which is located at 10695 Beach Blvd., Jacksonville, Fla. 32216.

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## Answers Users' Application Demands

## Supermini Software Cleans Up Sassoon DP Shop

LOS ANGELES — Rapid growth in sales of its beauty products throughout the '70s placed ever-growing strains on DP resources at Vidal Sassoon, Inc., a subsidiary of Richardson-Vicks, Inc., an international hair care and beauty products organization based here.

Users came to demand increasingly more from the shop's patchwork series of homegrown applications, which were written largely in Fortran and were difficult to modify. In time, the shop fell into the rut of doing more maintenance than new development.

Sassoon's data processing specialists realized in 1981 that a clean break was needed from their existing systems, and a search for new software began. Consultants were hired to examine user requirements and audit the DP department.

With the need for new applications verified, the selection cycle began with the premise that the software should drive the hardware choice. A checklist of features and functions was drawn up for the software.

"We looked at a number of software suppliers, including large mainframe companies," said John Seddon, Sassoon's manager of systems and programming. Ultimately, Sassoon settled on Los Angeles-based Computer Data Corp.'s "macs" applications running on two Hewlett-Packard Co. HP 3000 Series 44 superminicomputers. Seddon said the selection was based on the system's on-line capabilities.

## On-Line Transaction Editing

Of particular appeal was Computer Data's standard transaction file structure, Sila, which allows data entry to a standard format and provides the capability to edit transactions on-line then update immediately or off-line overnight. This contrasted with Sassoon's in-house system, which required batch data entry to disk and an overnight update remote from where the documents originated.

Why wasn't a mainframe computer the software on a supermini-computer turned out to be sufficient functionally, and the two HP 3000 Series 44s were capable of handling Sassoon's volume requirements, Seddon said.

"I find it hard now to distinguish between minis and mainframes," he added. "I used to work for IBM, and in retrospect I can't understand why I got so involved in all that complexity. Those IBM customers that I have visited are doing the same kind of things we are, but they have a huge overhead in terms of specialized data processing experts."

Installation of the applications began in March 1982. In preparation for the conversion from Sassoon's older hardware, a Data General Corp. Eclipse C/350, the DP staff wrote data conversion programs that included the capability of entering data only once while running in parallel. The staff produced a tape on its DG equipment, loaded that into a Sila batch and ran the data through the normal transaction processing to ensure that it was clean.

The general ledger and accounts receivable systems were brought up first and ran in parallel for three months. When manual balancing was performed to verify processing, the two balanced to within a penny.


After Sassoon was confident of the results from the general ledger and accounts receivable applications, the accounts payable was implemented.

Today, 40 terminals are connected to one of the HP 3000s and 20 terminals to the other machine. Approximately 3,000 vendors are maintained in accounts payable, with over 6,000 customers in the accounts receivable system. Sassoon's order entry system still runs on the Eclipse.

"I find it hard now to distinguish between minis and mainframes. I used to work for IBM, and in retrospect I can't understand why I got so involved in all that complexity. Those IBM customers that I have visited are doing the same kind of things we are, but they have a huge overhead in terms of specialized data processing experts."

Sassoon uses an open-item approach to accounts receivable processing. Disputed items and unsettled claims, for instance, can be excluded from processing so that their aging is truly representative. Cash is applied to individual items, while the items placed into disputed and unsettled claims do not age.

"It's much more evident what's going on — where the data's going," Seddon observed. Batch files can be examined on-line, and source entries exist that tell users exactly where the transactions originated. Since batch records are entered and can be corrected on-line, "users really feel that they own the data and are maintaining it. They have more control today than in the past."

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## At 112-Year-Old Distribution Firm Hardware Firm Stays Current With T/S Service

ATCHISON, Kan. — When you mention hardware to John Mize, more than likely he'll start talking about nuts, bolts and doorbells. But as president of Blish-Mize Co., a large hardware distribution firm based here, Mize does have more than a passing knowledge of computer hardware and its operation within a business environment.

Blish-Mize has grown steadily since its founding in 1871. A member of the PRO Hardware merchandising group, the company operates two warehouses with a total of 235,000 sq ft and does all its own deliveries with a fleet of trucks and trailers. John Mize is a fourth-generation de-

scendant of one of the firm's founders.

Mize fills orders and maintains his business with the help of a time-sharing service, Distribution IV, provided by Informatics General Corp.'s Management Systems Division in Columbus, Ohio. Distribution IV offers integrated information management systems for inventory, merchandising, retail customer services and financial applications, with minicomputer-based distributed data processing capabilities designed especially for distribution businesses such as Blish-Mize.

The time-sharing service's off-line processors interact with Blish-Mize's

in-house Harris Corp. 1625 minicomputer. "With 35,000 inventory items, approximately 1,800 customer accounts, 200 employees — including a network of 50 dealer service representatives in the field — and a lot of nickel-and-dime transactions flowing through, it's hard to imagine what we'd do today without this computerized support service," Mize said.

Mize claims the system has helped the firm boost its annual sales from \$12.5 million in 1972 to more than \$30 million in 1983.

Blish-Mize was one of the first firms to sign up for Distribution IV back in 1969. The 112-year-old dis-

tributor is presently turning its inventory about four times a year; the company's objective is five.

"Our company serves seven states fully," explained Mize. "Because of this diverse geography, we must carry a wide range of inventory. For example, in Colorado there is the tourist industry; in Oklahoma, the oil fields; in Arkansas, there is some mining; through Kansas, Nebraska and Oklahoma, we're into agriculture heavily. We are known for our breadth of inventory, and we rely heavily on Distribution IV to help us manage this wide product mix."

### User Input Substantial

One of the services of Distribution IV, the Automatic Back-Order System, was designed with substantial input from Blish-Mize and is still used extensively by the company. "It has been a real labor saver," Mize stated. "We also use the Direct Order Entry System to collect all orders and have saved much time and money by reducing the amount of mailing expenses and keypunch input."

The Order Scheduling System, also provided by Informatics, is particularly vital to day-to-day operations at Blish-Mize. As with the Direct Order Entry System, order scheduling is handled in Atchison with the Harris minicomputer connected to the Informatics Data Center in Culpeper. Because of the large geographic area served by Blish-Mize, the firm places high priority on handling orders quickly. The Order Scheduling System allows the firm to program its work load through the warehouse, Mize said.

"Our data processing people arrive at 6 a.m.," Mize explained, "and by 6 a.m., we have 95% to 96% of the orders ready to be processed that day. Using the Order Scheduling System, we then batch those orders and process them through the warehouse in accordance with delivery schedules. The first orders processed go into trailer one; then we start on the second trailer with the next orders in line."

"One of the greatest benefits of this system," Mize said, "is that warehouse personnel can program their work load for the day and shift resources to heavy-demand stations as necessary."



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See us at COMDEX/FALL '83, Booth A-215.

## Workstation Rules Out Paperwork for Court

FAIRFAX, Va. — It hasn't replaced the gavel as a judicial symbol, but a computer workstation, has become a fixture in one courtroom. It operates as part of a system that has reduced paperwork and improved accuracy and efficiency in the Circuit Court operation here.

Prior to automation in the late 1970s, the court clerk's office was overburdened with paperwork. Frequent interruptions prevented clerks from recording and filing important documents in a timely fashion, according to Circuit Court Clerk James Hoofnagle. "Employees were constantly thumbing through files to answer questions from the public, which meant they didn't have time to do their filing job," he recalled.

In September 1976, the Fairfax County computer staff and the 19th Judicial Circuit Court began general design work on a series of six applications packages. Those applications were to be run from the county mainframe, an IBM 3031. The first of those packages went on-line in October 1978, the last in January 1981. The six packages include jury management, civil case management, criminal case management, records indexing, automated land records and civil and criminal service.

### Terminals Purchased

Twenty-five IBM 3278 terminals were purchased to communicate with the county mainframe, running under CICS. Also purchased were two IBM 3278 printers, according to Circuit Court Management Analyst Shirley Buckley.

Prior to the automation project, Buckley was deputy clerk of the court. Selected to work on the application design project, she eventually became a liaison between the county programming staff and the clerical end users. Over the past six years, Buckley has moved from a primarily end-user orientation to one acutely aware of DP needs.

With automation, court employees have succeeded in erasing the backlog of work and have stayed on top of it ever since, Hoofnagle said. "We do today's work today." Even Chief Circuit Judge Bernard Jennings uses a display terminal — to check quickly judicial orders and other crucial details that can have a bearing on cases before his court, according to a county spokesman.

The system is the reason that clerks have been able to handle a 46% work load increase during this period,

even though the staff has only grown 22%, Hoofnagle said.

### Training Not a Problem

Supervised in-house, training was not a problem. Buckley, who was in charge of the training effort, estimated it took about two weeks of training before the staff was able to take over. "The system was really very easy to utilize. As a result,

most work was reduced by a minimum of 50%," according to Buckley.

Workers are now able to research questions from their desks, using display terminals to find answers quickly, which in turn gives them more time for other tasks. Also, they are able to process documents faster, indexing 830 land records one day recently. Court personnel agree that the IBM system

has saved them an astronomical amount of time, according to Hoofnagle.

Accuracy — a critical element in the court's record-keeping operation — also has been enhanced, Hoofnagle said. The system prevents errors by alerting clerks to mistakes through a flashing workstation screen. Further, "The computer is a great security tool for us. We have thousands of files, and if one

of those is ever misplaced, we wouldn't lose it because it's on the computer," Hoofnagle said. The court also maintains hard-copy backup, he added.

"Another fascinating feature of the system is that it allows several other agencies in the county to access our records via their terminals, rather than have to make a special trip or pick up the phone," Buckley said.

# TIS WINS INDUSTRY'S HIGHEST TECHNOLOGY AWARD.



## Off-Loads 95% of Data Entry Mini Helps Manufacturer Integrate Operations

BRAINTREE, Mass. — A user-oriented, on-line minicomputer system has helped a component manufacturer here integrate manufacturing and financial operations and off-load 95% of its data entry to end users.

Sigma Instruments, a division of the Wheelabrator-Frye Corp., is a manufacturer of electrical and mechanical

components that employs 1,200 workers. Its diversified product line of more than 7,000 items ranges from relays to stepping motors. Its operating facilities include the main plant here and several warehouses and assembly plants located in Connecticut, Mexico, Puerto Rico and Canada.

Based on his experience in

developing the turnkey system, Sigma DP Manager Paul Mesillo had some advice for companies about to embark on a computer project. "The first step should be to define clearly the goals and philosophies behind the implementation of the system. The second step is to find a software company who will work with you to achieve those

goals," he said.

### Change Philosophy

For 15 years, Sigma's financial and manufacturing information was processed on an IBM 360. In 1978, management decided it was ready to change both the system and Sigma's DP philosophy. It wanted to move from IBM batch mode to a more ef-

ficient, on-line, interactive minicomputer system. The goal was to separate the various data bases to create a common opportunity for growth while running on a turnkey system. Also, the decision was made to break the company into divisions by product line. Each area was to have DP capabilities in addition to its own engineering and administrative capabilities.

The criteria for the new system included a user-oriented approach and the ability to integrate manufacturing and financial operations. Aware that the system transition would be lengthy, Sigma also wanted a software company that would provide the necessary commitment during the process of accurately implementing and customizing a system.

After talking with a number of vendors, including IBM, Sperry Corp. and Burroughs Corp., the firm decided that Digital Equipment Corp.'s Datasystem 11/70 minicomputer and TEC Computer Systems, Inc.'s Manufacturing System Software could provide the right solution for Sigma.

"We chose TEC because we knew they were specialists with manufacturing systems, and we felt very comfortable with the company," Mesillo said. "With larger companies, you can spend half your time taught up with a lot of red tape. We knew we would be more in touch with TEC's upper management if we had needs," he added.

In addition, Sigma opted for "plain-vanilla" software. "With this package, you define your requirements and build the applications to suit your needs," Mesillo said.

### User Involvement

Begun in March 1981, Sigma's approach to system implementation stressed the importance of involving the users as much as possible in the process of defining the company's requirements. A project coordinator was selected from each division and for each application area

(Continued on Page 52)



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# Firm Integrates Operations With Aid of Mini

(Continued from Page 51) in the firm to work with the project leader from TEC.

Together they reviewed TEC's package and determined the specific enhancements that would be needed. TEC then implemented and tested the enhancements in-house before installing them at Sigma.

The manufacturing applications installed at Sigma are: inventory control, bill of

materials, material requirements planning, production control (job costing and scheduling) and purchasing.

## Financial Applications

Financial applications include order entry and invoicing, accounts receivable and accounts payable, TEC's Password Security Systems and English (a nontechnical data retrieval language) were installed.

Updated system documentation was also provided for approval. The next step was to demonstrate the capabilities of the modified system and get user acceptance at Sigma. The training phase took place prior to the software implementation to enable personnel to make immediate efficient use of the system.

The transition to the development environment was

easily made by Sigma's DP staff. Soon after the installation of the 11/70 system in January 1981, which included 42 DEC VT100 terminals and four LP11 printers, the staff was able to transfer a selected subset of its existing IBM programs to the DEC Datasystem, Meallo said.

This was accomplished with the RPG conversion utility provided with the system. The on-line program

development capability and complete documentation has allowed for an increase in programming productivity, and the DP staff now has the ability to respond quickly to user needs.

Connectability and compatibility are two features that have aided both management and users more than they had anticipated. The TEC System automatically checks the validity of data as it is entered. Because all transactions are verified immediately, the system saves time, effort and money.

## RTC Seminars For Programmers Using System/38

**NORTH ATTLEBORO, Mass.** — RTC Systems, Inc. recently announced two seminars for professional programmers using the IBM System/38.

A five-day Intensive Applications Seminar is reportedly designed to promote immediate productivity on the System/38 and includes instruction on creation of a data base, creating display device files and subfiles, RPG-III and control language programming and interactive data base utilities. Scheduled for Dec. 12-16 here, the seminar is limited to an enrollment of 12 and is priced at \$695.

A three-day RPG-III Structured Programming Course is reportedly designed to develop and expand the technical skills of the RPG programmer. It assumes prior knowledge of RPG-II and will be addressed only to the enhancements of RPG-III programming.

Scheduled for Dec. 6-8 here, the class is limited to 12 students and is priced at \$495.

Further information is available from RTC Systems Educational Center, 49 Plain St., North Attleboro, Mass. 02760.

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## With CICS Program Development Tool

# Chemical Firm Discovers Productivity Formula

IRVING, Texas — An on-line interactive CICS program development and query system has reportedly delivered the right formula — a 500% productivity boost compared to writing programs in Cobol — to NCH Corp., a large chemical sales and manufacturing company here.

NCH found the successful formula in March. Before that, explained Bill Stivers, manager of systems development at NCH, "A major problem we faced was the need for the productivity of our on-line transactions. We had a partially interactive CICS development system in-house for a year and a half [Informatics, Inc.'s Trans IV], add during that time we became convinced that the additional capabilities available in an interactive development language would be one way of reducing our development time and costs."

After looking at the range of products available on the market, NCH chose a package called Gener/OL from Pansophic Systems, Inc. of Oak Brook, Ill. "We felt that Gener/OL was superior," said Charlie McCarthy, NCH's vice-president of data processing. "It could handle approximately 95% of the CICS transactions that we had to write, while the other system was only handling 60% to 70% of those transactions."

Moreover, McCarthy said, the Pansophic product was much more resource-efficient than Cobol. "I think Gener/OL only uses 40% of the CPU cycles that the other product was using and only 60% of I/O calls," he said. "We found the transactions that the average CICS programmer can write using Gener/OL are as efficient as those that a CICS command-level Cobol programmer was writing."

"From inception to delivery, the average command-level Cobol pro-

gram takes about three to four weeks. Under Gener/OL, the same program takes about three to five days," McCarthy noted.

### 'Completely Interactive'

Stivers believes the most beneficial aspect of the Gener/OL system is that "it's completely interactive in the coding phase. It checks syntax as you enter statements; in debugging, it tells you at which statement your transaction blew up; and it does not require a core dump. This saves a lot of time and does not interrupt the mental process of coding."

About eight people on Stivers' staff are now using Gener/OL exclu-

sively. "We have observed across-the-board results," he said.

"We came up with a ratio of 5:1 in writing Cobol programs vs. the time that is required for writing the Gener/OL programs. This ratio assumes a fairly complex program that can be written in both languages," Stivers maintained.

Both McCarthy and Stivers said that Gener/OL was easy to learn. "We have recent college graduates using Gener/OL," McCarthy said. "They have data processing backgrounds and are finding Gener/OL very easy to use and similar to languages that they learned on micros at college."

Stivers continued, "The average person on our staff took a half day to a whole day to learn Gener/OL to the point where he could write a simple transaction. The staff's acceptance of Gener/OL was very good."

So far, Stivers' staff has completed a legal contract system, an electronic mail system and a job for the order department that enables them to review orders more easily.

"We have also done a mailing program, which is basically an inquiry system that can select and produce mailing labels for a region. We are also going to do an employee accounts payable system with Gener/OL," Stivers noted.



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## DPMAEF Board Elects Deken

PARK RIDGE, Ill. — Joseph G. Deken, author of *The Electronic Cottage* and *Computer Images: State of the Art*, has been elected to a three-year term as member of the board of directors of the Data Processing Management Association Education Foundation (DPMAEF).

Deken is assistant professor in the Department of General Business and the Department of Computer Science at the University of Texas at Austin. He earned an B.A. in physics in 1970 from Washington University, St. Louis, and a Ph.D. in statistics in 1976 from Stanford University. From 1979 to 1981, Deken was a National Science Foundation mathematical sciences postdoctoral research fellow at Stanford.

The DPMAEF is dedicated to enhancing educational opportunities for information systems professionals. The nonprofit organization was established to meet the changing educational requirements of the information processing profession and industry. The DPMAEF is located at 505 Busse Highway, Park Ridge, Ill. 60066.

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**DA** DATA DESIGN ASSOCIATES

# Mini Helps Children's Home Handle Reporting

**BETHLEHEM, Pa.** — Installing customized software and a new mini-computer system has enabled the staff at The Wiley House, Inc. here to concentrate on helping children instead of shuffling papers.

Wiley House is licensed to perform 16 types of programs for disturbed and distraught children at its main campus. In 1980, the institute's staff found itself increasingly buried under reports and evaluations required to maintain funding for the various programs.

John P. Peter, executive director at Wiley House, recalled the situation he faced in 1979 when the requirements to obtain funding became increasingly complex. "The increase in regulations came at a time when we were considering an expansion to handle more children at our six locations throughout Pennsylvania's Lehigh Valley. We had to decide whether to add more professional staff, with a consequent higher salary burden, or to cut back on child enrollment so the current staff could properly handle the increasing administrative work load. The last thing we wanted to do was turn children away."

## Over 7,000 Children Served

The institute takes its name from James Wiley, a retired sea captain who first purchased the site in the 1880s to establish a children's home. Since that time, the house has served more than 7,000 children. The pace has picked up in the last nine years, according to Educational Services Director Richard Babayk, who pointed out that 1,000 children will probably be served this year alone.

According to Peter, "We knew we would have to get into data processing. There really was no choice. If we didn't automate, we would probably go under. At the very least, we could forget about increasing our enrollments."

The institute's staff began looking for a system to suit its needs. After attending a computer fair in Philadelphia, staff came away impressed with the equipment and the services from Wang Laboratories, Inc., Peter said. Wang visited the Wiley House to evaluate the needs of the institute and later returned with a proposal built around a Wang 2200 MVP mini-computer with 256K bytes of memory, six terminals and five printers.

Applications software was obtained from The Office Manager, Inc. of Seattle and customized to the institute's specifications by the Technic Corp. out of Scranton, Pa. According to Babayk, the institute knew exactly what it wanted and chose the more expensive alternative of having software customized rather than buying

it "canned." The principal data processing operations are known as "Individual and Group Therapy with Full Automation" and "The Wiley House Data Communications Program of Psychiatric Treatment and Special Education."

The Wang 2200 MVP came on-line at Wiley House in early 1980. It ran in tandem with the manual way of doing things for the first six months. The results since the conversion have been impressive.

The system was designed for the central office staff. "We had one person who had some experience with computers, but not much, and none of them," Babayk recalled. "All the people in the office picked up the system within one month."

Kathleen Korutz, the office manager, learned to operate the system from the Wang training manual; today, she trains the new word processing operators. "The technology of the MVP is not hard to grasp," she said. "Compiling data using the old manual methods could take as long as a full day; now, it is a matter of minutes," she said.

The Wang 2200 MVP allows Wiley House to standardize information covering virtually every conceivable aspect of a child's behavior, providing a measure of an individual's growth in the treatment program, according to Tom Mentis, director of clinical services.

"Behavior is measured in 40 major classifications with three subclassifications to each major category. Using the Wang system, we are able to match a child's behavior against statistical norms to determine his or her relation to peers. This technique helps us to structure programs according to the specific needs of a child," he said.

A file of some 20,000 names of actual and potential supporters has been developed. "Shortly after we put in the MVP," Peter said, "we used it to handle a \$30,000 solicitation drive. It's also being used for a \$2.5 million capital campaign, the fruits of which will be a new child development and therapeutic recreation center. Using the MVP, we've been able to raise about \$90,000 a year."

# matchmaker,

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"Hackers Get into Us Last Night."

## Runs on IBM Machines

## Operating System Saves Cost of Programmer

SAN FRANCISCO — When Walker Interactive Products, Inc. began to offer computer services to outside customers, it could not afford to hire a systems programmer to support the operation.

The DP staff at Walker was already accustomed to working with a variety of IBM operating systems on its 3083 mainframe. Because Walker's primary business is supplying interactive financial software for mainframes, the staff was required to emulate its customers' operating system environments by running VM, VS, and VSI.

But when Walker needed an operating system to support its outside

service bureau customers, Data Center manager Thomas Dowling estimated he would need at least one, full-time systems programmer if the firm installed an IBM system. Dowling knew that the fledgling company would have difficulty absorbing the cost of a programmer, so he decided to look beyond the range of IBM operating systems.

Walker installed an IBM-compatible operating system — DOS/MVT — offered by San Francisco-based Software Pursuits, Inc. "DOS/MVT let us get by for two years without a full-time systems programmer. That saved us at least \$100,000 a year, or about the price of a 4331. It kept

overhead to a minimum, which is critical when you're selling excess machine capacity," said Walker President Richard Currier.

Dowling performed the conversion last year in a single weekend when Walker installed Software Pursuits' enhanced version of DOS/MVT, the MVT/VSE.

Dowling said he alone maintains MVT/VSE and that Walker never expended any programming effort on either of the IBM-compatible operating systems.

"Even though systems programmers have been on staff for the last year," Dowling said, "we have never spent any programming time on

DOS/MVT or MVT/VSE. We did not hire a systems programmer until we began running IBM's VM concurrently with MVT/VSE and began operating OS machines."

## Better Features

According to Dowling, the MVT/VSE operating system offered features that converged comparable IBM capabilities.

Its SAGE spooler was easier to use and more flexible than IBM's Power spooler, he said. Before Walker took delivery of its 3083, it ran SAGE in a double-machine environment utilizing a 4341 on loan from IBM and a Magnuson Computer Systems, Inc. Model M80/42 processor.

The 4341 handled both on-line and batch jobs, and the Magnuson processed only batch.

From their terminals, Walker's programmers submitted all jobs to the 4341 and, based on machine capacity, SAGE ran their batch work on either machine. All jobs were placed in a common queue and then executed in whatever machine the DP staff chose.

That capability, Currier said, gave Walker the processing capabilities it needed until the 3083 was installed.

MVT/VSE's Proc library support feature also provided more flexibility than IBM's MVS operating system's capabilities, Dowling added. For example, "the system's conditional statements multiply the Job Control Language flexibility by permitting a procedure to invoke another procedure, depending on the outcome of a prior step."

They also let the operator restart a job at a specified step by entering a single Proc statement, and variable symbol substitution lets us establish values at runtime."



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## For Work in Info Engineering UK Professor Wins Warnier Prize

TOPEKA, Kan. — Enid Mumford, a professor at the UK's Manchester Business School, was recently named the first recipient of the J.D. Warnier Prize for major contributions to the theory and practical application of information engineering. The award was made at the Data Structured Systems Development Users Conference, which was sponsored by Ken

Orr and Associates, Inc.

Mumford has done research in the design and human consequences of computer-based work systems for 15 years. The author of several books on systems design and the involvement of end users, she has developed a systems design methodology called Effective Technical and Human Design of Computer-Based Systems.

The prize received by Mumford was named in honor of Jean-Dominique Warnier, a recently retired member of a research group at CIL-Honeywell Bull in France, who is considered one of Europe's leaders in the information science field and has published several books on logical approaches to solving problems with data processing systems.



Enid Mumford

## Denver Meet To Address Managing DP Conflicts

DENVER — A seminar on "Conflict Management in the DP Environment" will be held Dec. 5-7 in Denver. It will be taught by Leo Johnson, principal consultant to QED Information Sciences, Inc. of Wellesley, Mass.

The course will help DP managers understand sources of conflict in the DP environment and teach them how to manage that conflict more effectively, according to its sponsor, QED and the Seminar Broker of Broomfield, Colo. Topics will include definition of conflict, exploring the basic elements of conflict, examining conflict resolution styles, interpersonal conflict, group conflict and differences, tools for effective conflict resolution and developing an action plan.

The three-day seminar costs \$500. More information is available from Mary Willard, Seminar Broker, 3212 W. 133 Ave., Broomfield, Colo. 80020.

## Syntopian XII To Take Place In Chicago

CHICAGO — Syntopian XII, the annual conference of the Association of Information Systems Professionals (AISP), will be held here July 17-21.

Syntopian XII's theme is "Communicating Information: People, Systems, Networks." Professional papers pertaining to the theme in either a technical or managerial sense are currently being requested.

The deadline for receipt of completed papers is Nov. 30, 1983. All submissions will be reviewed and considered by the Syntopian Advisory Committee for possible presentation at the conference or for publication in the annual Papers and Proceedings book.

Registration for the conference is tentatively set at \$300 for members and \$400 for nonmembers. More information is available from AISP at 1015 N. York Road, Willow Grove, Pa. 19090.



## SCIENCE/SCOPE

A high-speed integrated optic modulator for fiber optic applications promises to significantly affect the future of microwave transmissions. The device, developed by Hughes Aircraft Company research scientists, is a guided-wave Mach-Zehnder interferometer. Light entering the interferometer is split into two arms and then recombined. By applying an electric field to one arm, a relative phase shift is induced so that the light, upon recombining, interferes to produce an intensity variation proportional to the applied electric field. The field is applied by a microminiature traveling-wave electrode design with a 3 dB bandwidth of 17 GHz. Only 6 volts of drive are required. This modulator will let a fiber optic link transmit simultaneously all common microwave and radar bands.

An advanced infrared seeker now being developed would improve the operating range and accuracy of future air-to-ground missiles and guided bombs. Hughes is producing a scanning focal plane array (FPA) seeker to demonstrate advanced infrared imagery. The sensor is the size of a collar button and consists of tiny infrared detectors on one side and a corresponding number of signal-processing elements on the other. Because the sensor would be more sensitive than existing devices, it can stay locked on small targets more easily, distinguish between targets and background clutter more easily, and detect targets from farther away. The seeker also promises benefits in weight and cost. Hughes also will conduct a study to determine whether the seeker would be feasible for a variety of weapons planned by the U.S. Air Force and Army for between 1990 and 2000.

A new computer system promises to reduce scrap and rework, thereby helping one Hughes group slash costs by an estimated \$1.5 million annually. The Quality Information System (QIS), now under development, will compile and analyze data on how defects happen and how they are corrected. Information will be made available to manufacturing employees for immediate feedback and for use during production. Data will also be kept in a central historical file for future reference. QIS is expected to improve quality by spotting problems that stem from faulty design, poor supplier quality, and improper manufacturing methods.

An infrared sensor made of standard components turns night into day for tanks and other combat vehicles. The compact device, called Hughes Infrared Equipment (HIRE), was designed to be low in cost yet high performing. It can be adapted to periscopes to let gunners of such tanks as the M48 see through darkness, haze, or battlefield smoke. HIRE can be mounted in laser tank fire control systems, light armored vehicles, or used as a target acquisition/fire control sight for anti-aircraft, ship, and helicopter applications. The design uses U.S. Army common modules, the standard building blocks for thermal imaging systems.

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To reserve a place call Harry Merkin at (617) 329-7700.

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## Graphics Tool Helps Bechtel Rewrite Application Library

WALNUT CREEK, Calif. — When Bechtel Power Corp. here decided to rewrite its entire library of accounting and financial applications, the DP department was faced with a costly and time-consuming documentation effort.

In May 1979, the controller's organization within the company began a development effort called the Controller Financial Information Systems (CFIS) project to replace Bechtel's existing applications programs, such as payroll, billing and accounts payable. Scheduled for completion in 1986, CFIS will support all of Bechtel's permanent offices and the many remote offices it maintains at its electric power, petroleum and mining projects around the world.

The development method Bechtel planned to use on the CFIS project incorporated structured analysis techniques, such as data flow diagramming, to describe user requirements. While this technique was a proven and effective approach to software-system development, it would require a great deal of time to draw and redesign diagrams.

Documentation for the project would include several hundred data flow diagrams alone. The project team needed an automated tool to relieve it of the task of drawing and proofreading these documents.

After reviewing a variety of programmer productivity packages, the project team chose the Stradis/Draw interactive graphics system from McDonnell Douglas Automation Co. of St. Louis, Mo. The package facilitated the drawing and revision of the CFIS project data flow diagrams and systems structure charts on Bechtel's two Tektronix, Inc. Model 4113A color graphics terminals, which access an IBM 3033 mainframe.

Stradis/Draw allowed the design team to construct diagrams on-screen through a menu-driven process. All the graphics symbols used to design the structured diagrams were defined within the system; they could be identified using a function key and positioned on the display screen by the terminal cursor.

After the project team created a diagram, the diagram could be maintained in an interactively accessible file for on-line editing, and hard-copy plots of the diagrams could be produced for presentations.

Bechtel has used Stradis/Draw to support documentation of the entire CFIS project thus far, reportedly saving considerable time and money. With the McDonnell Douglas package, project members gave rough diagram copies to a data entry operator who entered the diagram. By allowing someone else to generate and maintain diagrams, the package permitted the project analysts to concentrate on important design activities.

Because the data entry operator was not required to redraw an entire diagram to make revisions, the amount of proofreading involved was reduced.

In addition, Bechtel has saved money in producing permanent hard-copy diagrams for the CFIS project. Printed diagram copies from Stradis/Draw were found to be

cheaper to produce than those done manually by a graphics department. Also, while the diagrams were of equal quality, the time required to produce copies with the package was substantially less.

Project analysts also used a "free-form" diagram function of Stradis/Draw to develop a variety of other charts and graphs for management presentations.

Bechtel has also reaped some other benefits. Since the CFIS analysis team began to use the Stradis/Draw package, it said it has achieved greater consistency within the library of diagrams. The system has helped maintain a standard presentation for-



The Stradis/Draw Interactive Graphics System

mat, which is used by the many application groups generating diagrams for review by the end-user community. The end users have said the Stradis/Draw documents are easy to review and understand.





## And Reduces Telecommunications Costs Engineers' WP System Cuts Prep Time by 85%

**CHERRY HILL, N.J.** — An engineering firm here has cut preparation time for specifications and energy audits by up to 85% after switching from typewriters to a word processing system. Telecommunications costs are down as well, and automated recordkeeping has become a source of management information.

Colm Engineering has handled planning and design for more than 170 projects since it was founded 11 years ago. The firm has a long-standing involvement in energy conservation and management, as well as alternative energy systems.

In the past, getting project specifications

typed often turned into a headache, according to Howard Colm, company founder and president. Depending on the type of project, a specification can have as many as 200 pages. In the early years, Colm had his typing jobs done by a service bureau. Turnaround time was slow, however, and corrections added more costs and delays. Eventually, the company began handling part of the typing load in-house on an electronic typewriter, but putting together a specification was still "cut-and-paste." To grow and serve its clients better, Colm concluded, his company needed word processing support.

A survey of some 40 systems in 1979 by Colm's son Stephen, also an engineer, ended in 1980 with the choice of a Wang Laboratories, Inc. Word Processor System 5/III. "We were looking for superior equipment, and we felt we'd give better service with Wang systems," Colm recalled.

The system, purchased in 1980, consisted of a dual-diskette drive, a workstation and a daisy-wheel printer. A second System 5 was added within a year. In late 1982, Colm replaced both stand-alone Systems 5s with a Wang Office Information System (OIS) 105. Equipped with telecommunications capabilities and

built around a master processor with a single-diskette drive and a 4.2M-byte system disk, it includes two workstations and a printer.

Since the first system went on-line in the fall of 1980, Colm and his staff have worked out a highly efficient procedure for producing specifications. Time savings begin at the drafting stage. Parts of earlier specifications often serve as starting points for writing up a new project. Rather than piece a draft together himself, an engineer now asks a secretary for sections or selected pages of appropriate specs. The secretary then electronically retrieves and merges them into a new draft.

### Little New Typing Required

Because a draft already exists in electronic form, very little new typing is required. Editing functions such as delete, insert, move and copy make it easy to enter revisions, executive secretary Ursula Bielecki reported. Paragraph files allow quick retrieval of often-used blocks of text. To insert entire pages into specifications, she prefers to create glossaries, which allow her to call up text with two keystrokes. She has also written glossaries to speed up entries on standard forms.

"The most important thing for us is to give our customers service, and the best way to do that is to respond quickly," Colm commented. "We can put together a specification in two days instead of a week and a half, and we get to do a much more professional job."

The ability to rearrange charts or tables quickly led to a successful experiment: Equipment schedules for the drawings that accompany specifications are no longer written by hand or typed, but produced on the OIS. Printouts of the schedules are copied onto adhesive-backed mylar, which is then attached to the drawings. Schedules are stored on diskette, so the formats can be reused.

Technical assistance reports are another service the company has successfully automated. Colm has also built a file of some 150 energy-saving maintenance and operating procedures. "That way we can do the reports competitively," Colm maintained. "In fact, we paid for the first System 5 on one of these projects."

Telecommunications costs have been down since staffers began transmitting data through one of the System 5s and later through the OIS. "With the data terminal we had been using, we were putting the data in at a much slower rate, and we didn't have that much storage capacity," Colm explained. "Now, we load the data on the disk and then put it all out at one shot. And we can receive the analyses on the disk and print them at our leisure."

For Colm, office automation has become an indispensable competitive tool. "We were probably one of the first companies in this area to install a word processing system," he said. "The next step we're going to take is to automate drafting. You have to move in this direction. It's the only way you can increase productivity and serve your clients."

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# DBMS Spurs Parisian Horse Racing to the Wire

PARIS — In France, data processing is as integral a part of horse racing as horse racing is to the French.

The DP department of the Societes des Courses Parisiennes is made up of five different departments that deal with a variety of management applications, including licenses for over 250,000 horsemen, insurance and diplomas for the French Equestrian Federation.

The bulk of data processing, however, relates to horse-racing information processing. At the beginning of each year, all data regarding the races for that year are entered into the data base system. After each race, a series of updates and print-outs is required. More than 300 data entries are gathered for each horse, over 70 of which deal with blood types.

After each race — over

15,000 are held every year — 250 operations have to be performed for each of the first five winners, according to DP manager Jean-Louis Maldant. These operations require the transfer of data to third-person accounts — owners, jockeys, trainers, stable boys — all according to a system of various bonuses and compensations that are subject to a very complex horse-racing code.

The very severe constraints and controls of the Societes, as well as the quantity and importance of the information to be processed, caused Maldant's department in 1975 to consider the purchase of a data base management system (DBMS). Until then, the department had been working with sequential and indexed files.

Maldant's investigation of various systems took two

months. Each system was evaluated for its ability to respond to the severe specifications needed to manage the accounts of show-horse owners. Finally, Cullinet Software, Inc.'s IDMS was chosen.

"IDMS brings much better efficiency and is easier to use and develop applications with than IBM's DL/I," Maldant explained. "Certain aspects of modeling and processing using other DBMS were more difficult to implement."

According to Maldant, IDMS was chosen as "the system which could best meet the particularly severe requirements of the Societes: very large amounts of elementary data, numerous and complex overlappings of technical and management data, the need for fast updating and distribution of information and the generation of a great number of financial operations made from technical data."

Another consideration that tipped the scale in favor of IDMS was the system's ability to modify the structure of data, which is critical for an organization such as the Societes des Courses Parisiennes, whose rules evolve continuously.

IDMS was installed in 1975, and today, using Cobol as the main programming language, IDMS runs on two IBM 4341 systems with over 120 terminals throughout the organization.

Until 1978, five different services had to be processed separately: "people," "horses," "races," "results" and "accounting." With IDMS up and running, one information structure is enough to feed the whole organization, and 80% of all account operations are automatically generated, including those concerning compensatory operations with foreign countries.

"One of the main strong points of IDMS in comparison to its competitors is the great ease and rapidity of development with Cullinet's Application Development System/Online," Maldant said. "This allows considerable savings of time and money, given the large quantity of data to be processed."



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## Retrieves Data, Generates Reports Package Eases Processing for Rainware Maker

ELDERSBURG, Md. — Think of fog and you invariably think of London. It should follow, then, that if you think of London Fog raincoats, you think of London. Right? Wrong.

Londontown, the company, that stole trench coat fame away from Humphrey Bogart, is alive and well and producing London Fog rainwear in Maryland.

To make life sunnier for those involved in data processing, Londontown recently installed a data base query software package.

Ralph A. Hoffmeister, data base administrator for Londontown, implemented Scientific and Business Systems, Inc.'s Easywork package in order to define the data structure, retrieve data and generate a report in one step. Londontown installed Easywork in 1980 when the company's computer system consisted of a

Honeywell, Inc. 66/60 mainframe running under Honeywell's Goe 3 operating system. Shortly thereafter, the company upgraded its hardware to a Honeywell, Inc. DPS 8/52 mainframe also running under Goe 3.

### Upgrade to 'Umbrella' Package

Londontown is currently upgrading its software from Honeywell's IDS 1 DBMS to Honeywell's DM4, an umbrella software package that includes IDS 2, an upgraded version of IDS 1, and a Cobol 74 compiler with transaction processing software. The system also includes five Honeywell MSU 500 disk drives and four MSU 450 disk drives.

According to Hoffmeister, Londontown is constantly trying to develop more on-line systems. His staff of five is responsible for all data base design, implementation, restart/re-

covery and security, as well as for defining the system parameters for their on-line systems.

In addition, the group develops interface modules for the integration of data with different systems. (Other functions are handled by three additional groups in the DP department, which numbers some 65 people in all. Half of these form the Operations Group; the rest, the Technical Support and Analysis/Programming Groups.)

### Rewriting Programs Eliminated

"By using Easywork for the generation of data base content reports under the IDS 2 environment, the necessity of having to rewrite all 'chain walk' programs is eliminated since Easywork will generate that capability," Hoffmeister said.

When Easywork was installed, its chief uses were in the order processing and engineering departments as well as in the Data Base Group for producing sophisticated reports from their data bases. The DP department is the biggest user of the package, with the majority of applications going to the departments that have the fewest management decision-making systems available to them — the sales and marketing departments.

The marketing department, like marketing departments elsewhere,

however, is acknowledging the potential of DP. One of the most recent Easywork applications is a three-pronged marketing report which contains a comparison of bookings with both the forecast and the inventory position.

"This is the first time we've been able to produce a single report that combines the results of these three different applications," Hoffmeister said.

### Priority Basis

All requests for Easywork-generated reports are handled by Hoffmeister's department, which enables him to control the system and allocate resources on a priority basis.

Opening up the system for anyone to submit reports at will would necessarily exclude other, perhaps more important, jobs; so, at least for the present, the Data Base Group is serving as a clearinghouse for all such requests.

"However," Hoffmeister added, "we've just implemented Easywork's interactive feature, and our planning for end users includes allowing Easywork usage by non-DP personnel." The group is presently evaluating use of Easywork as a Cobol generator for the development of production systems for reports that are run frequently.

## Free Brochures

• "V/Update," a free monthly newsletter, is available to all VM in installations from VM Systems Group, Inc., developers of VM software products. The newsletter contains

hints and information for VM installations.

To receive "V/Update" or information about products, contact VM Systems Group, Inc., 3123 N. Military Road, Arlington, Va. 22207.

• "The Tape Management and Evaluation Technical Manual" is a 48-page manual from Data Devices International, Inc. that describes tape fundamentals and provides a completed description of data transfer losses. It outlines a systems approach to media maintenance.

The manual discusses the three phases of media maintenance and provides detailed instructions for each phase. A technical reference and glossary of terms is included, together with a reference list. The manual is from Data Devices International, 20235 Bahama St., Chatsworth, Calif. 91311.



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# Desktop Speeds Freight Rates to Firm's Clients

UNION, N.J. — Before installing a computer to handle its freight consulting business, F.H. Traper, Inc. had to rely on an all-manual system, which was complicated, time-consuming and prone to human error.

Now, however, a desktop microcomputer takes care of all that and reportedly provides accurate freight rates for its clients in less than 30 seconds.

The ability to produce extremely fast, accurate freight and invoice documentation can substantially impact profitability in many corporate areas — from finance to marketing — according to Glenn A. Fishman, president of the two-year-old firm.

Up until a few years ago, managing transportation cost data — the number-one activity of traffic/distribution departments — had to be done manually, using paper ponies (tariff guides) and a space-consuming reference library of regulatory and rate tomes. Until shippers and carriers employed some type of automated freight rate updating service, the rates for most shipments were incorrectly derived and posted, according to Fishman.

Also, with the advent of deregulation of freight rates (Motor Carrier Act, 1980 and Staggers Act-Rail, 1978) the increase in paper/tariff data was complicated further. The proliferation of tariffs and tariff changes produced more chaos in the

management of the freight tariff functions, Fishman said. "We needed even further refinement of our approach to rate maintenance and tariff data control. Computerization was the only answer to increased productivity and accuracy at lower costs," he added.

Confronted with the overwhelming impact of deregulation, Traper started investigating alternatives to existing automated systems in the spring of 1982. Among the software companies examined were Numerex, Inc., ESI, Inc. and Rand/TDM, ac-

cording to Marc Cooper, Traper executive vice-president.

"We were aware that Lester A. Probst, president of Transportation Concepts and Services, Inc. (TCS) had covered this information in presentations given at various transportation seminars and conferences," Fishman noted. The Probst demonstrations convinced Cooper to purchase two Trans-Port systems from Bell & Howell.

Each Trans-Port system consists of an Apple Computer, Inc. Apple IIe system and software designed by

TCS, Cooper said.

Traper claims the desktop Trans-Port system has proven to be three or four times faster than on-line computer systems and at least 500 times faster than manual freight rate retrieval. It is also less costly than using typical manual techniques, a service bureau or a time-share facility.

The system also allows the firm to handle clients that have great work loads. For example, for a major manufacturer of beauty products, Traper now processes over 40,000 bills monthly.

## Monitors Electrical Consumption

# System Helps Hotel Casino Cut Power Bill

LAS VEGAS — Over the past four years, a hotel and casino here has cut its power bill by more than \$248,000 by installing a computer to help control electrical consumption. The system monitors the power meter and automatically shuts off unused equipment.

From March 1979 to March 1983, despite rate increases, the Frontier Hotel and Casino's power bill went down by more than \$248,000, according to Curt Thompson, Frontier's vice-president in charge of hotel operations. Nearly two million fewer kWh of electricity were used in 1982 than in 1978.

In addition to saving money, the Frontier received a governor's award in 1982 for energy conservation.

The IBM Series/1 controls 52 electronic devices, ranging from air conditioning and ventilation equipment in the casino and conference rooms to the bulbs on the marquee.

The hotel's engineering crew can override the computer at any time and program it to switch on specific circuits at certain times of the day.

Richard Lang, manager of facilities projects for Frontier's parent company, Summa Corp., said the hotel approached energy conservation cautiously.

"We're running a resort," Lang said. "People come here to be comfortable."

The computer does not interfere with the cooling system in the casinos or showrooms during the peak business hours between 3 p.m. and 2 a.m. After 2 a.m., the Series/1 shuts off the air conditioning for at least a few minutes of every hour.

The hotel tries to maintain a conducive temperature level. "We think because of the tension and excitement, people may become a little bit warmer and, consequently, they'd like it to be a little cooler than a typical office," Lang said.

According to Richard Whelan, Frontier's chief engineer, lighting, ventilation and air conditioning in the gaming, show and conference rooms account for 60% of the hotel's electric bill. There are 20,000 lights in the signs alone.

Air conditioning and lighting in

the guest rooms consume 25% to 30% of the hotel's power, with the balance consumed by a variety of appliances. Slot machines require very little electricity, according to Whelan.

Phil Arce, president of the Frontier, said management is committed to the energy conservation program and additional steps will be taken to reduce further the hotel's power bill.

The hotel plans to install banks of low-voltage, 50W lights over the gaming tables, replacing the high-voltage, 500W quartz lights now in use. The new lights will reportedly provide better lighting and use less electricity.

The Frontier also plans to install movement sensors in its guest rooms. When the rooms are empty, the air conditioning will be switched to a more energy-efficient setting. When a guest returns to his room, he'll be able to readjust the temperature to his liking.



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## Effects Changes in System Requirements

## Rolm's Growth Produces Special DP Hurdles

SANTA CLARA, Calif. — A dramatic growth rate over the last five years at Rolm Corp. here has brought with it special kinds of data processing problems. The manufacturer and distributor of computer-controlled, voice and data private branch exchanges, electronic office products and Data General Corp.-compatible computers has seen annual sales rise to nearly \$500 million while the number of employees has increased to more than 6,500.

Five years ago, Rolm contracted with Ross Systems, Inc., a Palo Alto, Calif.-based time-sharing company, to provide a proprietary financial consolidation and reporting system. However, Rolm's sales growth soon led to changes in system requirements.

First, Rolm decentralized, creating several new divisions. Then each new division hired its own financial executive who had unique information requirements. Procedural delays and costs associated with relying on an outside vendor for program changes increased to an uncomfortable level, according to Mark Brönder, corporate division controller.

In addition, Ross Systems' Maps, a proprietary decision support system (DSS) language, was a precompiler with embedded Basic instructions. While it was capable of meeting sys-

"The decision support system developed by and for Rolm's corporate staff 'has cut the time required to consolidate monthly actuals and forecasts at least in half, thus freeing several highly paid financial professionals for analytical rather than 'rack 'em and stack 'em' duties.'"

tem specifications, major changes required too much time. With limited time and a tight budget, Rolm was forced to take shortcuts in some crucial areas, according to Stephen Locke, financial systems analyst.

The company decided to bring the development and maintenance functions in-house and seek a more flexible DSS language to run on its IBM 4341 Model Group II processor. Twenty-two DSS tools for mainframes were examined.

Ultimately, both a DSS language and Information Builders, Inc.'s Focus, a stand-alone data base management system/report writer, were acquired. Focus has been successfully used on several applications, but has proven to be inadequate for financial matrix applications, Locke said. Much of the functionality is mutually exclusive.

Number of Report Formats	280 +
Number of Line Items	300 +
Number of Months	48
Number of Reporting Entities	37
Number of Consolidation Levels	8
Type of Data	Actuals, Forecast, Target
Virtual Memory	3 MB
Disk Storage	106 CYL (IBM 2375 Disk Drive)
IBM 4341 CPU Hours/Month	5-6
Number of Users	30 +
Number of CMS IO's	17
Language	EMS
Vendor	Economic Sciences Corp.
Operating System	VM/CMS

Rolm Chart

Figure 1: Facts About Facts, the Rolm DSS

EMS from Economic Sciences, Inc. of Berkeley, Calif., was selected because it provided fourth-generation capabilities, efficient computer resource utilization, was available on IBM mainframes under VM/CMS and could be brought in-house on a monthly leased basis, Brönder said.

Using EMS first on National CSS, Inc.'s time-sharing service and later in-house, a DSS called Facts was developed by and for the Rolm corporate staff to consolidate actual, forecast and targeted financial data from

the various divisions (see Figure 1). One systems analyst developed and implemented the first release of Facts, including comprehensive documentation, within five months.

"The system has cut the time required to consolidate monthly actuals and forecasts at least in half, thus freeing several highly paid financial professionals for analytical rather than 'rack 'em and stack 'em' duties," Brönder said.

The system has now been extended. (Continued on Page 64)

## China Computerworld

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The PRC is a huge country which now has a rapidly growing skilled base of computers. And the future looks very bright for the Chinese EDP market.

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China Computerworld is a joint venture of the Fourth Ministry of Machine Building and CW Communications, Inc. Its 50,000 subscribers include the key government officials and computer managers who have EDP purchase decision authority.

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## Roim's Growth Brings With It Special Hurdles

(Continued from Page 63)

ed to the largest division at Roim, which sells and services Roim products, he said.

One systems analyst "cloned" and modified the corporate version of Facts in weeks.

### Users Across the Country

Users from 14 sales and service subsidiaries located across the country enter data into this system. These users access the system via Tymnet, Inc.'s Tymnet into a Tymnet engine that is located at Roim in Santa Clara and from there into a Roim digital computerized branch exchange (CBX) that is equipped to handle both voice and data communications.

The Roim CBX acts as a local-area network allowing users access to their choice of processors, including 14 Hewlett-Packard Co. HP 3000s, 23 DG Eclipse MV/8000 superminicomputers and the IBM 4341.

Users of Facts select the IBM 4341 and then access the system (see Figure 2).

Ease of system development and the ability to respond quickly to sys-

tem maintenance and enhancement requirements is a major advantage of EMS," Locke explained.

"A total investment of less than 1½ man-years over a two-year period has been made in Facts, including development, constant changes and expansion and major reorganizations

of the company," according to analyst Locke.

Though he conceded that the learning curve on EMS is fairly high, financial analysts previously untrained in computers have successfully used the computer to meet their needs, sometimes preferring to use

EMS for "quick-and-dirty" analysis over Visicorp's Visicalc on a personal computer.

Now EMS does the heavy-duty computing while personal computers handle ad hoc analysis where access to the large Facts data base is not mandatory.

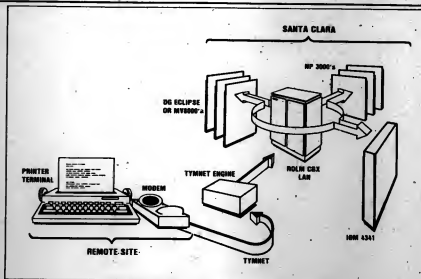


Figure 2: Roim's Telecommunications Link

Roim Corp.

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## Tristar Data Systems to Hold Meet on Corporate Use of Micros

CHERRY HILL, N.J. — Tristar Data Systems, Inc. will hold a free one-day seminar Nov. 15 at the Sheraton-Poste Inn here on the use of microcomputers by corporate executives and DP managers.

The seminar will focus on integrating microcomputers into large corporations and will feature addresses by representatives of a vari-

ety of microcomputer manufacturers, Tristar said.

The featured speaker will be author Victor Vurpillat, who recently completed a public television series titled *Conversation With the Future*.

More information is available from Tristar Data Systems, Cherry Hill Industrial Center, 2 Keystone Ave., Cherry Hill, N.J. 08003.

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## Updated Monthly

## Datapro Service Looks at Micros

DELRAN, N.J. — Datapro Research Corp. has launched a new reporting service aimed at the microcomputer market.

Called "Datapro Reports on Microcomputers," the service consists of two loose-leaf volumes totaling approximately 2,000 pages that are updated on a monthly basis. Updates include changes in original material, as well as additional information on hardware and software products, a spokesman said.

The service also includes access to the firm's consulting group, via a hotline telephone number, for late-breaking information on new equipment and software.

The publication compares

## Rome to Host World Forum On Data Policies

ROME — The Second World Conference on Transborder Data Flow Policies will be held here June 26-29. The conference is being organized by the Intergovernmental Bureau for Information (IBI).

The first conference, organized by the IBI in 1980, presented the international community with an opportunity to identify the main economic, legal and sociocultural aspects inherent to transborder data flows, according to an IBI spokesman.

The second conference will attempt to examine fundamental aspects of transborder data flows that are of interest to developing countries; a further objective is to encourage the establishment and adoption of universal principles or to set up mechanisms for the future formulation of principles.

Any individuals or organizations seeking further information on participation or presentation of papers may contact the IBI through the Department of Policies, P.O. Box 10253, 00144 Rome, Italy.

equipment from more than 1,000 vendors and formal comparisons of 30 of the most prominent microcomputer systems and 40 of the most popular peripherals," the spokesman noted.

In addition to the report, subscribers will also receive a copy of a survey conducted by Datapro of nearly 6,000 users of microcomputers across the country. The sur-

vey presents user ratings of 126 computers from 57 manufacturers; 19 operating systems; 13 popular software packages; and 90 peripherals.

"Datapro Reports on Microcomputers" costs \$600 per year. Both the service and the included survey will be available in December. Datapro said from 1805 Underwood Blvd., Delran, N.J. 08075.

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For a technical data sheet, write to Hewlett-Packard, Literature Distribution, 1825 Embarcadero Rd., Palo Alto, California 94304 or for more information, call your local HP sales office listed in the telephone directory white pages. Ask for an HP Instruments Field Engineer.



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How Attached Were You to Your Computer, A?



## Officers Elected for 1983-1984 At AIM's Annual Conference

HILTON HEAD, S.C.—Covel Allen, vice-president of the Western Savings and Loan Association of Phoenix, was elected president when the Association of Information Managers for Financial Institutions (AIM) elected its 1983-84 officers during its annual conference held here.

A. Paul Cox Jr., president of Data Systems Corp. of Richmond, Va., was chosen to serve as vice-president of AIM. Both Allen and Cox will serve one-year terms.

AIM members also elected six new representatives to three-year terms on the organization's 16-member governing board. They are Marc DeFano, senior vice-president of the

American Savings and Loan Association of Whittier, Calif.; Howard Hanson, president of On-Line Computer Services of Seattle, Wash.; Dan Lanphear, president of First Chicago Data Corp. of Chicago; Linda M. Martin, senior vice-president of the Valley Federal Savings and Loan Association of Van Nuys, Calif.; Larry Morse, president of Northeast Datacom, Wallingford, Conn.; and Paul Williams, vice-president of Union National Bank in Little Rock, Ark.

An affiliate of the Financial Managers Society, Inc., AIM is a national organization for individuals who develop and operate automated support systems in financial institutions.

## 'Diversifying Technology' Theme Of Comtec Convention

SAN FRANCISCO — "Diversifying Technology" is the theme of the 14th Annual Convention of Comtec, an association of professional users and vendors in the computer micrographic industry, which will be held at the Westin Miyako Hotel here Feb. 20-23.

The conference will reportedly feature lectures on the various data processing methods and techniques interfacing with computer micrographics.

Technical presentations on micro-publishing, business graphics, alphanumeric and computer micrographics and scientific graphics will also be offered.

High-technology subjects covered

at the meeting will include imaging art management for electronic publications, turnkey microcomputer-based graphic systems, hardware and software considerations for computer micrographics, computer micrographics and video systems, computer-aided design and computer micrographics and trends in the computer micrographics marketplace.

Registration for the conference is \$295 until Dec. 31 and \$320 after the above date, a conference spokesman said.

Further information is available from Comtec, which can be reached at Suite 200, 100 N. Winchester Blvd., San Jose, Calif. 95128.

## Babbage Trustees Name Bauer Foundation Head

MINNEAPOLIS — The trustees of the Charles Babbage Foundation (CBF) here have elected Dr. Walter Bauer as foundation chairman. He is currently chairman of Informatics General Corp., a software and professional services firm he founded in 1962.

The trustees also recognized Edwin Tomash, the founder of Dataproducts, Corp. and other high-technology firms, for his role in the creation of the Babbage Institute and five years of service as the CBF's chairman. Tomash was elected as Chairman Emeritus.

Elected as foundation president for 1984 was James Birkenstock. Now retired, he was a long-time employee of IBM where he was a senior officer responsible for all phases of management of industrial and intellectual property rights.

Formed in 1978, the CBF supports the activities of the Charles Babbage Institute, an information processing, industry-sponsored center located on the University of Minnesota campus. The institute encourages the study of technical and socioeconomic aspects of the industry's development.

Both the Charles Babbage Institute and Foundation are located at 104 Walter Library, 117 Pleasant St. S.E., University of Minnesota, Minneapolis, Minn. 55455.

## See COBOL.

Dick is a COBOL programmer. Dick is bored. Harried. Overworked. Dick struggles with tedious tasks and

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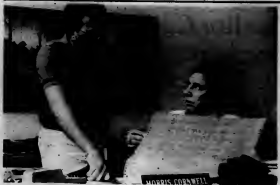
## COMPUTERS

COMPARING OUR PRICES



DEAN BUCK





Morris Cornwell (seated), Cochrane Furniture Co.'s information systems manager, reviews health insurance reports with Neal H. Rhine, vice-president of finance. The reports help Cochrane evaluate employee needs for new health plan coverage.

## Furniture Firm Carves Out In-House Insurance Plan With Turnkey Installation

LINCOLN, N.C. — A furniture company here has recently made a name for itself among its employees and health care providers as a top-notch health insurance plan administrator.

At its headquarters here, Cochrane Furniture Co. now processes a monthly average of about 400 health insurance claims for its 700 to 750 full-time employees and their families.

Morris Cornwell, manager of Information Systems, said the company's 1982 decision to self-administer

its employee health insurance plan has dramatically cut benefit costs and simultaneously improved plan efficiency and employee morale.

"We took our first actions to reduce health insurance plan costs in 1977 when we opted for self-insurance and self-funding," Cornwell said.

"Management was very concerned that health insurance premiums, which impact balance sheets as operating expenses, were escalating year after year.

"So to contain costs, we first embraced the idea of a self-funded insurance plan as a proven way to reduce expenses," Cornwell said.

"However, we continued to have a major insurance company administer our plan, which meant we were still paying \$40,000 a year in administrative service charges alone. Yet we were dissatisfied with the service. Finally, we decided that self-administration could improve the plan and reduce costs."

In June 1982, Cochrane installed an Applied Digital Data Systems, Inc. Mentor 4000 minicomputer and CG Data Corp.'s fully automated claims terminal system software to bring administration in-house. CG Sales, out of St. Petersburg, Fla., provided the equipment and software as a turnkey system.

### Project Benefits

The projected benefits quickly materialized. Processing is faster — the average claim is now paid within three days of its receipt.

Cochrane's total health insurance plan costs have stabilized. It no longer pays any out-of-pocket administrative costs, which, given inflation, would now exceed its previous \$40,000 annual total.

Though Cochrane has expanded its plan's coverage, administrative efficiencies have enabled the company to hold the line on premium costs.

"The result is that we can offer employees a really good health care plan while containing premium costs shared by employees and the company," Cornwell said.

"With our automated claims-processing system, we feel like we're doing justice to everybody concerned — employees and their families, health care providers and the company."

"Initially, we projected savings would pay for the minicomputer system and software we purchased within one to two years," he added. "But it now appears that the payback period will be even shorter."

The furniture manufacturer has a Sperry Corp. computer that runs a comprehensive on-line manufacturing control system for all plants, but it ruled out using this mainframe for insurance claims processing.

The nine-person MIS department had neither the time nor expertise to write the software, according to Cornwell.

Claims for employees at all Cochrane facilities are processed by the

(Continued on Page 68)

branches. The view is precise. Compact. Unambiguous. And there's no waiting for computer time.

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# System Helps Feedlot Monitor Cattle's Weight

CALEXICO, Calif. — A computer system is helping a California feedlot operator decide when cattle are putting on too much weight.

Cutting back on feed at that point means more appetizing cuts of meat for the consumer and more cost-efficient operation for Hartman & Williams here, one of the oldest feedlot operators in the Imperial Valley.

According to Hartman & Williams manager Tom Remington, a certain amount of fat is desirable because it helps produce tender, flavorful cuts of beef. However, because fat contains more than twice the stored energy of an equal weight of muscle tissue, it takes more feed to produce a pound of fat than it does a pound of lean beef.

Hartman & Williams installed an IBM System/34 in 1980 to keep track of weight gain in proportion to feed. When the rate of gain falls off, the feed is being turned into excess fat instead of lean meat.

"The computer monitors how much the cattle are eating," Remington said.

"It estimates what their gain should be from that consumption." It allows us to determine the point at which, on a cost basis, the animal has reached a point of diminishing returns — the point at which the gain costs more than what it's going to sell for on the market."

Nearly all of the approximately 30,000 head of cattle that pass through the Hartman & Williams

feedlot in a year are part Brahman, selected because they tend to be leaner than other breeds. The cattle weigh about 300 pounds when they arrive. In about nine months, they gain 600 to 700 pounds before being sold to meat packers.

In addition to monitoring weight gain, the computer double checks the records maintained for each lot of cattle in the yard.

As many as 22,000 head of cattle, divided into more than 100 lots, may be in the yard at any one time, Remington said. Feedlot workers record the amount and type of feed delivered to each lot. By comparing records, the computer can point out apparent discrepancies in the feeding schedule, such as when the wrong

formula or amount is delivered to a particular lot.

Remington said he was amazed at the number of errors that showed up in the feeding records once he started to cross-check them with the computer. Cattle feeders operate on a narrow margin, and feeding errors can quickly add up to lost profits.

The IBM system provides a weekly report that lists the average daily consumption of feed the number of days the cattle have been in the yard, the formula they take, total weight gain and total cost.

Although Hartman & Williams own some of the cattle in the feedlot, most are owned by investors. The computer prepares itemized bills as well as profit and loss statements for each investor. It generates a report listing each individual partner's gain or loss for groups of up to 10 investors.

Hartman & Williams also mixes its own feed. Remington said the computer helps him analyze commodity prices so he can decide which grains or agricultural by-products are the best buys at any given time in a rapidly changing market.

The feedlot uses three different feed formulas, and because some of the ingredients are interchangeable, analyses are very complicated.

"The IBM system can complete an analysis within five minutes, making it feasible to do more analyses more often and have better information to help make major purchasing decisions," Remington said.

## Firm Improves Insurance Plan

(Continued from Page 67)

equivalent of one full-time staffer here, where the majority of Cochrane's work force is based.

"We're not using data processing staff to run our system," Cornwell said. "Instead we've trained employees who previously interfaced with the insurance company so no additional staff was required to bring claims processing in-house."

Cornwell said he believes internal administration of health insurance plans is fast becoming an industry trend.

"At a summer 1983 industry meeting, perhaps 75% of the 24 companies were self-insured," he noted. "But only one other company besides Cochrane was handling its own administration. Since then, though, several companies have called to say they're taking this route."

"Another self-insured company, located about 25 miles from us, is purchasing time on our system as a pilot project," Cornwell explained. "A modem links a CRT and a small printer to our system so it can process claims for one of its divisions."

"I don't see us outgrowing this system, though we'll probably add memory, another disk drive and another port for more CRTs," Cornwell said.

"We looked at expansion options closely because we realized we would probably want to do this new distributive data processing capability," he said.

## The Control Concepts CC-3276 terminal has upset Telex, Teletype, Raytheon and Courier.

It would seem a little odd because Control Concepts leads the competition with its CC-3276 plug-compatible terminal — clearly the most affordable stand-alone controller/display station on the market today. The CC-3276 features built-in SBC protocols for use in remote offices, which eliminate cabling for interactive access to your SNA network. It also features the only integrated 2400 baud dual modem currently available in any 3270 terminal. But that's just the beginning. The Control Concepts Systems

Engineers make system start-up fast and easy. The CC-3276 also comes with a separately addressable printer port as standard equipment, and can be teamed with almost any asynchronous printer for use as a 3271. Try to find a comparable model for the same price. It simply can't be done. For high quality, advanced technology and cost effectiveness, you need look no further than the Control Concepts CC-3276. And the competition knows it. For further information call toll-free, 1-800-368-3078.

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# Dairy Uses Micro, Tradition to Manage Herds

LANESBORO, Minn. — On a 750-acre dairy farm in Minnesota, traditional herd management has been combined with modern microcomputer technology to help increase milk production and decrease costs.

"Feed represents as much as 50% of a dairy farm's overhead, and the use of the computer to monitor and regulate the herd's intake compared to its milk production means a significant savings," explained Gary Eide, who, along with his father Gen, owns the Eide farm. "We're achieving a better balance between feed and production, and we're wasting less feed concentrate."

The Eides use an Altos Computer Systems, Inc. 8000-10 microcomputer, combined with Northhouse Industries, Inc.'s (NII) Herdstar, a dairy management software package. The system tracks breeding and calving as well as the amount of feed each cow gets to achieve its milking peak.

The computer is kept in the main house, with additional terminals in the milk house, where the cows are fed, and the milking parlor, where they are milked. Using Digital Research, Inc.'s MP/M multitasking operating system, the main house computer terminal can be in operation checking on weekly production, while a dairyman in the milk house is determining the status of an individual cow's daily feed allotment.

## Protection From the Cold

Because of the especially harsh environment in the milking parlor, a membrane keyboard terminal with an LCD display is used there. This adds protection from water and dust to the unit. Underground cables connect terminals to the main-house computer, providing insurance against damage during the severe cold and ice storms of Minnesota winters.

A traditional milk herd management method segregates cows by various groupings — one such grouping is production (measured in pounds of milk) — so that high producers (25 to 100 or more pounds of milk per day) can be fed appropriate amounts of grain, while lower producers receive less.

A large farm may have three or four such groupings, requiring more barns, sleeping and feeding facilities than the Eides can provide. So, instead of depending on physical segregation of the milk animals, the Eides monitor the herd with Herdstar software and the Altos computer.

NII developed the Herdstar software over a period of three to four years. Dr. Richard Northhouse, founder of NII and Comco Farm Computer Systems, had made several visits over the course of a year to the Eide farm to study the specifics of its operation before recommending the present system.

The main use of the system, with Herdstar's Herd Manager program, is to track the breeding, calving and dry periods of each milk cow. However, the software also handles feed rationing and requirements.

Each cow in the herd is assigned a number and wears an electronic transponder around its neck. Sensors in each of the six feeding stalls react to the transponder, sending a coded

signal to the computer. This identification is critical to the success of the system because it allows the computer to recognize each animal when it appears in a feeding stall.

A feeding record is kept in the computer's 10M-byte hard disk memory for each animal. The amount and type of feed is determined based on National Research Council nutritional guidelines and the cow's milk production. For body maintenance and quality milk production, each cow's protein intake must be watched closely.

"Even though the automatic herd feeders are over 600 feet from our Altos computer, we can actually sit at the terminal, display and check which cow is in which feeder at any

moment," Eide said. "The animal is identified by number on the screen, and the brightness level of that number indicates whether the cow will be fed this time or not."

"The amount of feed is controlled by the Herdstar computer program, and the system operates 24 hours a day, seven days a week," he added. "We think of it as our 24-hour hired hand."

The microcomputer maintains feed records on each cow in the Eides' herd for about 3½ years. This aids the family in cost analysis, profit and loss determination and maintenance of a healthy, productive herd. Since cows must be bred periodically to maintain their milk production capabilities, the program also re-

ports on the animal's ovulation cycle, determines proper breeding and expected calving dates, predicts when the cows should dry up and performs other aspects of animal maintenance.

A software program known as Reproduction Manager, also from NII, provides details on which cows were "mated" to which bulls. The animals are bred through artificial insemination, and the bull sires are chosen from a catalog listing.

One other NII software program Eide uses, the Heifer Manager, also helps him track individual calves from birth through first breeding (usually at 12 to 14 months of age).

"We use the computer twice a day," Eide said. "It's as important to our operations as tractors and silos."

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## Seminar on Preventing DP Crime Set This Week in Paris

PARIS — The Institut de Formation Interbancaire is sponsoring an international seminar on "Security for Computer Crime Prevention," which is taking place Nov. 17-18 in the George V Hotel here. DP crime specialist Donn B. Parker from SRI International, Inc., Menlo Park, Calif., will conduct the seminar.

The seminar objective is to provide the latest safeguarding methods and controls in an information age context based on actual losses from computer crime. The program will be divided into three sections:

- Identified crime — funds

transfer, program falsification, automated teller machine attacks and credit card fraud.

- Prevention and control methods — physical, technical and human controls; security procedures; investigation methods; and staff training.

- Evolution — increase in crime and risk-reduction efforts.

The seminar costs \$445. This includes conference papers and refreshments during breaks and lunches. More information is available from the Office de Recherche d'Organisation et de Sécurité, 42 Blvd. Pasteur, 75015 Paris, France.

## TI to Sponsor and Supply Products to U.S. Ski Team

AUSTIN, Texas — Texas Instruments, Inc. has announced its official sponsorship of the U.S. Ski Team. TI will supply the team with an array of computing products, including a multiuser minicomputer system, personal computers, printers, portable terminals and home computers.

"We're excited about incorporating computing power into our growing and active organization," said liver Aimee, the U.S. Ski Team's executive director. "The computers will help us receive critical information faster and give us access to new data that will help our athletes keep that competitive edge."

"One of the applications we're

planning includes communicating with the U.S. Olympic Committee's computer in Colorado Springs, Colo., for various functions ranging from accounting to athlete information," Aimee said. "In addition, we're considering the possibility of interacting with equipment at the Olympic Training Center in Colorado Springs. We will look at using the TI computers for psychological testing, sports medicine information and computerized testing of both skiing techniques and equipment."

The minicomputer system will be used by the Ski Team administration at its headquarters in Park City, Utah, to handle the day-to-day operations of the team. These include such tasks as accounting, donation management, tracking the activities of athletes, tabulation of race results, operation of the Ski Team press information office and the storing and transmitting of race results.

The team coaches and office staff will use the TI Personal Computer for managing individual data bases, mailing lists and word processing.

Portable terminals will be taken on the road to help the team keep up with its education while training and while on location at World Cup and Olympic events.

## Advisory Group Seeking Names For OA Awards

WASHINGTON, D.C. — Nominations for the 1984 Federal Office Systems Expo (Fose) Office Automation Achievement Award for the commercial sector are being sought by Fose's Commercial Program Advisory Committee.

Eligible individuals must have implemented office automation systems within their organizations that have increased professional productivity, achieved cost savings, provided a useful product that could be adapted by others or lead to new business opportunities, the Fose committee representative said.

The committee is particularly interested in achievements in the areas of decision support systems, professional and executive training, information centers, integrated communications strategies, wide and local-area networking and the integration of microcomputers with mainframes and minicomputers.

Nominations for the Office Automation Achievement Award, which will be presented at the 1984 Federal Office Systems Expo to be held here March 19-22 at the Washington, D.C. Convention Center, must include the name, address and telephone number of the nominee. Submissions must also include a description of the project and a summary of the results, the committee spokesman said.

Nominations must be in by Jan. 31, and more information is available from the conference sponsor, National Trade Productions, Inc., at 9415 Annapolis Road, Lanham, Md. 20706.

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9600 bps via the standard binary synchronous (BSC) line protocol.

The 3270 comes standard with the P31 green phosphor display. Color and amber monitors are available as options. The monitor is adjustable and the keyboard is detachable for operator comfort, and the system can be arranged to compensate for ambient lighting conditions.

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## For Upper Management

## Deltak Announces Video Courses

NAPERVILLE, Ill. — Deltak, Inc. has announced four video courses:

• "Increasing DP Productivity," a video journal composed of three courses offering a view of current DP productivity problems and potential solutions.

This series was designed for upper management inside and outside of the DP department, development support teams, systems analysts and project managers, Deltak said.

The courses are available for an average rental fee of \$50 to \$125/mo per course, depending on volume. Purchase price is \$1,750 per course.

• "The Micro/Mainframe Link," a video-magazine that provides a look at the problems and opportunities associated with linking stand-alone microcomputers with corporate mainframes.

This is one tape in a series of half-hour videotapes focusing on the latest developments in information technology, Deltak said.

Program rentals average \$50 to \$125/mo per program, depending on volume. Purchase price is \$450 each.

• "VSE, DCOS/VSE and DCOS/V5 for Application Programmers" is a series presented through videotapes, audiotapes and text.

The five training courses that complete this series include "The VSE Linkage Editor," "Using VSE Libraries and Cataloged Procedures," "VSE Utility Programs," "VSE Sort/Merge Utility" and "VSE Debugging."

Students must have access to Apple Computer, Inc.'s 48K-byte Apple II+ with two disk drives and an Apple language system to complete the training. It was designed for self-instruction, and the microcomputer encourages this method by diagnosing and prescribing the training needed, according to the vendor.

Average rental for courses is \$50 to \$125/mo per course, depending on volume. Purchase price is \$1,750 each.

• "IMS/VS Data Communications Programming," a four-course series that analyzes three types of on-line application programs: batch message processing, message processing, conventional and message processing non-conventional.

A working knowledge of Cobol, PL/I or assembler and DL/I application programming is required for this series. The average rental fee for this course is \$50 to \$125/mo. Purchase price is \$1,750. Further information on the above products is available from Deltak, East/West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

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## Calendar

## Week of Nov. 20

Nov. 24, Washington, D.C. — Telephone Bypass Technologies and Economics. Contact: Telestrategies, Inc., 6842 Elm St., Box 874, McLean, Va. 22101.

## Week of Nov. 27

Nov. 28, Denver — Structured Systems Development. Contact: Youdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28, New York — Computer Acquisition and Disposition. Contact: 20th Century Systems, 647 E. Carpenter Drive, Palatine, Ill.

60067.

Nov. 28, San Francisco — Artificial Intelligence. Contact: Youdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 29-Dec. 1 in San Francisco.

Nov. 28-29, Chicago — Data Communication: Advanced Concepts, Products and Systems. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-29, San Francisco — Introduction to the Tools of Structured Design. Contact: Youdon, Inc., 1133 Ave.

of the Americas, New York, N.Y. 10036.

Nov. 28-29, Orlando, Fla. — How to Manage Data and Information as a Resource. Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Nov. 28-29, Salt Lake City, Utah — Systematic Software Testing. Contact: Youdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-29, Atlantic City, N.J. — Software Quality Assurance and Validation. Contact: Education Foundation of the Data Processing Manage-

ment Association, P.O. Box 3608, Department SQA, Torrance, Calif. 90501.

Nov. 28-29, New York — Management Implications of Structured Techniques for Microprocessors. Contact: Youdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-29, Denver — Introduction to TSO/ISPE/SDSF. Contact: Steve Comstock, 256A S. Monaco Pkwy., Denver, Colo. 80224.

Nov. 28-30, Houston — Data Base Management Systems: Concepts and Guidelines. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Parsippany, N.J. — Data Processing for the Non-DP Executive. Contact: Chubb Institute, 8 Sylvan Way, Parsippany, N.J. 07054.

Nov. 28-30, Los Angeles — Data Communications: Effective Network Design. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Denver — Data Communications Systems. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Gary St., Santa Ana, Calif. 92705.

Nov. 28-30, Atlanta — Data Base Management Systems: A Comparative Analysis

of General-Purpose Systems. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Minneapolis — Micro and Home Computers: Technology and Applications. Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 28-30, Philadelphia — Personal Computers: Strategies for Managing. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Chicago — Structured Analysis for Users. Contact: Youdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-30, Washington, D.C. — Computer-Generated Business Graphics for Today's Manager. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Arlington, Va. — Network Communications Protocols. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Gary St., Santa Ana, Calif. 92705.

Nov. 28-30, Chicago — Microcomputers: A Guide to Selection and Application. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Chicago — DOS/VSE Job Control Language. Contact: Youdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-30, Washington, D.C. — Distributed Systems Designs: Micro to Mainframes. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Phoenix — Personal Computers and Networking. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Gary St., Santa Ana, Calif. 92705.

Nov. 28-30, San Francisco — Data Base Management Systems for Micros and Minis. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Denver — Dbase II for the PC User. Contact: The Institute for Professional Education, Suite 303, 1515 N. Court House Road, Arlington, Va. 22201.

Nov. 28-30, Chicago — Information Systems Modeling, Analysis and Planning. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Hartford, Conn. — Unix. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Gary St., Santa Ana, Calif.

(Continued on Page 74)

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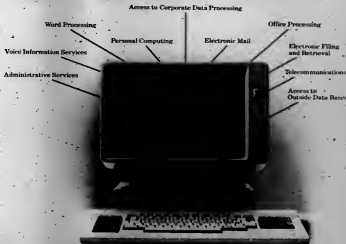
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## Calendar

(Continued from Page 72)

92705.

Nov. 28-30, San Francisco — Advanced DP Management: Methods and Techniques in the '80s. Contact: Datapro, Inc., Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-Dec. 2, Detroit — Structured Analysis and Design Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 28-Dec. 2 in Indianapolis.

Nov. 28-Dec. 2, Las Vegas — Comdex/Fall. Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

Nov. 28-Dec. 2, Fort Lauderdale, Fla. — How to Increase the Productivity of Computer People, Including Implications of Office Automation for the User as a Programmer and Systems Developer. Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

Nov. 28-Dec. 2, Anaheim, Calif. — Structured Analysis and System Specification Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 28-Dec. 2 in Atlanta and in Washington, D.C.

Nov. 28-Dec. 2, Atlanta — Structured Systems Design/Structured Program Design Combined Course. Contact: Georganna Carson, Ken Orr and Associates, Inc., 1725 Cagle Blvd., Topeka, Kan. 66604.

Nov. 28-Dec. 2, Chicago — Information Modeling Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-Dec. 2, Seattle — Auditing in the Contemporary Computer Environment. Contact: Marge Umor, EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

Nov. 28-Dec. 2, San Francisco — Structured Design Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-Dec. 2, Englewood Cliffs, N.J. — Effective Data Base Design. Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Nov. 28-Dec. 2, Denver — Structured Analysis for Real-Time Systems. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-Dec. 2, Rochester, N.Y. — Structured Analysis Workshop. Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y.

10011.

Nov. 28-Dec. 2, Chicago — Information Modeling Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 28-Dec. 2 in Houston.

Nov. 28-Dec. 2, New Orleans — System Resource Planning and Selection. Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

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Nov. 28-Dec. 2, Houston — CICS/VS Macro-Level Coding. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-Dec. 2, San Francisco — Project Planning and Control Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 28-Dec. 2 in Chicago.

Nov. 28-Dec. 2, Boston — Auditing Structured Analysis and Design Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-Dec. 2, San Francisco — Computer Performance Measurement Capacity Planning. Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 28-Dec. 2, Phoenix — IMS Application Programming Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-Dec. 2, San Francisco — Stress Management. Contact: Registrar, Control Data Management Institute, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 28-Dec. 2, Boston — CICS/VS Command-Level

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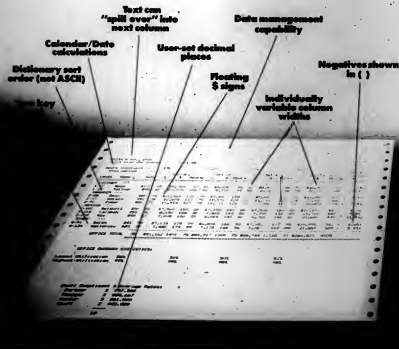
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## Calendar

Coding. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-Dec. 2, Chicago — IMS Logical Data Base Design and Implementation. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 29, New York — Technology Briefing. Contact: 20th Century Systems, 647 E. Carpenter Drive, Palatine, Ill. 60067.

Nov. 29-30, San Francisco — Effective Communication Skills for DP Professionals. Contact: Registrar, Control Data Management Institute, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 29-30, New York — Strategic Redistribution of Computer. Contact: The Conference Board, 845 Third Ave., New York, N.Y. 10022.

Nov. 29-Dec. 1, Arlington,

Va. — SAS Macro Language Course. Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Nov. 29-Dec. 1, Minneapolis — Data Communications: Network, Design and Optimization. Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 29-Dec. 1, San Francisco — Computer Networks. Contact: Technology

Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

Nov. 29-Dec. 2, Washington, D.C. — Data Base Management Systems: Mini, Micro and Distributed Applications. Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045.

Nov. 29-Dec. 2, Washington, D.C. — Data Communi-

cations: Components, Systems and Networks. Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 29-Dec. 2, Atlanta — System Administration and Performance Monitoring for Honeywell Large System Users. Contact: Technology Information Systems, Inc., 2305 E. Lincoln Drive, Phoenix, Ariz. 85016.

Nov. 30, New York — Contract Negotiations. Contact: 20th Century Systems, 647 E. Carpenter Drive, Palatine, Ill. 60067.

Nov. 30-Dec. 2, Washington, D.C. — Software Quality Assurance. Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 30-Dec. 2, Washington, D.C. — Robotics and Artificial Intelligence. Contact: Manufacturing Productivity Center, U.S. Professional Development Institute, Robotics/Artificial Intelligence, Department AB, 1805 Powder Mill Road, Silver Spring, Md. 20903.

Nov. 30-Dec. 2, Arlington, Va. — SAS Basic Course. Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Nov. 30-Dec. 2, Washington, D.C. — Managing Microcomputer Systems. Contact: U.S. Professional Development Institute, Managing Microcomputers, Department A, 1805 Powder Mill Road, Silver Spring, Md. 20903.

Nov. 30-Dec. 2, Orlando, Fla. — How to Build and Use a Data and Information Resource Directory. Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Nov. 30-Dec. 2, Philadelphia — Systems Analysis and Design: Concepts and Effective Practice. Contact: Datapro Research Corp., 1605 Underwood Blvd., Delran, N.J. 08075.

(Continued on Page 76)

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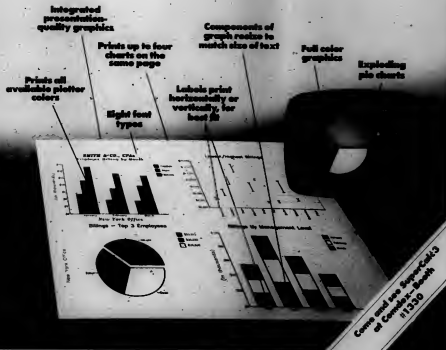
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## Calendar

(Continued from Page 75)  
 Nov. 30-Dec. 2, Washington, D.C. — **Capacity Management Forum.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Nov. 30-Dec. 2, Seattle — **Local-Area Networks.** Contact: Center for Advanced Professional Education, Suite 110, 1620 E. Garry St., Santa Ana, Calif. 92705.

Nov. 30-Dec. 2, Chicago — **Computer Performance Measurements and Capacity Planning: Tools and Techniques.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 30-Dec. 2, San Francisco — **Office Automation: Concepts, Systems and Implementation.** Contact: Registrar, Control Data Management Institute, 6003

Executive Blvd., Rockville, Md. 20852.

Nov. 30-Dec. 2, Denver — **MVS, JCL and Utilities.** Contact: Steve Comstock, 256A S. Monaco Pkwy., Denver, Colo. 80224.

Nov. 30-Dec. 2, San Francisco — **Managing Proliferation of Small Computers.** Contact: The Institute for Professional Education, Suite 303, 1515 N. Court House Road, Arlington, Va. 22201.

Nov. 30-Dec. 2, Chicago — **Basic Systems Analysis.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 30-Dec. 2, Washington, D.C. — **Simulation Modeling for Decision Making.** Contact: The Institute for Professional Education, Suite 303, 1515 N. Court House Road, Arlington, Va. 22201.

Nov. 30-Dec. 2, New York

— **DL/I Application Programming.** Contact: Kaaren Perez, Comped, 10 E. 21st St., New York, N.Y. 10010.

## Report Outlines Ways to Guard Against DP Theft

**NEW YORK** — In a special report called "Safeguarding Your Business Against Theft and Vandalism," the Research Institute of America (RIA) estimates that \$70 billion is lost annually to white-collar computer-related crimes, fraud and embezzlement, and another \$30 billion each year disappears to theft, inventory shrinkage and unidentified pilferage.

Many companies refuse to believe that they could have a serious security problem, the report says. The common reaction to such crime reports, according to consultants surveyed in the report, is always "but our employees wouldn't steal."

While this is sometimes true, security expert Norman Japan maintains that when his team of consultants visit a new corporate client, they know they have a better than 50% chance of uncovering a major case of theft or financial manipulation and a 75% chance of finding "costly malpractices."

The RIA report offers an overview of the various steps that go into a loss prevention program and provides guidelines for reviewing present practices and procedures to determine where the weak links might be, a spokesman said.

The report is available for \$25 from RIA's Membership Service Group, Mount Kisco, N.Y. 10549.

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# PANSOPHIC®

## EDITORIAL

### New Kids on the Block

The emergence of a new decision support system department in a number of large corporations has meant a new title for the person managing the department. It has also added one more element to the corporate political structure with which today's management information systems director must cope — whether he wants to or not.

Formal DSS departments did not suddenly spring full-blown because overambitious administrators wanted to increase their visibility by adding more reporting lines on corporate organization charts. But the fact is that the decision support function is a highly visible one, and the MIS executive who only reluctantly agrees to cooperate with the newly powerful manager of decision support applications may find himself in an untenable position.

Areas falling within the DSS manager's purview tend to incorporate end-user-oriented entities such as the information center, office systems, financial modeling and manpower planning. These functions, and the people working with them, have needs that have apparently not been successfully addressed by the traditional MIS department. Yet, decision support managers recently interviewed by *Computerworld* maintained that the very act of filling these needs generates some antagonism from MIS employees [CW, Nov. 7].

It is, perhaps, natural to feel some resentment for coworkers who have the advantage of interacting with top management without having had to pay dues in the less glamorous and less visible systems department. However, the wise MIS executive will realize that the new kids on the block in the DSS department can make his job much easier by taking away the increasing pressure from end users who want their information problems solved now and simply don't want to hear about things like a two-year applications backlog.

Offloading functions, like financial modeling, that depend on immediate turnaround to the DSS area can free MIS personnel to cut that backlog down and respond to complex and sophisticated user requests that require the expertise of the professional information systems specialist. And the DSS department can offer another choice of career path for programmers and analysts who wish to develop business expertise to complement their technical knowledge.

Thus, cooperation between MIS and DSS managers can work to everyone's advantage. The end user gets his solutions more quickly, the MIS executive can utilize his resources more effectively, and the technical specialist has the opportunity to round out his professional background. An obstructionist attitude toward DSS from the person at the top of the information systems organization can only work to his disadvantage and, with increasingly computer-literate top management, eventually lead to political disaster in the corporate arena.

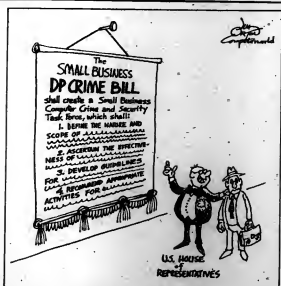
## DATA PAST

Five Years Ago  
Nov. 13, 1978

LOS ANGELES — The Federal Bureau of Investigation arrested a computer consultant, Stanley Mark Rifkin, on charges of using Fedwire, the Federal Reserve's electronic funds transfer system, to steal \$10.2 million from the Security Pacific Bank here. The heist was considered to be one of the largest thefts in U.S. banking history.

Ten Years Ago  
Nov. 14, 1973

LOS ANGELES — A computerized car-pool system established here successfully matched 1,700 persons in the first week of operation. But the system was also criticized for creating a confidentiality problem for police officers, whose home addresses were listed on the computer printouts and then posted in some city buildings.



"Why Hit the Computer Criminal With Legal Penalties When We Can Drown Him in a Sea of Paper?"

## LETTERS

### Major Mistake

Deregulating the channel service unit (CSU) in Dispatch Digital Service (DDS) circuits is a major mistake, in the words of a DDS user.

DDS has been a premium service, which offers high reliability to its limited number of electronic components.

Responses to problems on a DDS were quick, due to a single party being involved and the party's ability to test all components on that system.

With the CSU installed at either end, AT&T is able to ensure that the line is operational end to end. Without the AT&T CSU in place, it is impossible to differentiate between line problems and customer premise equipment problems through a central site test.

The portion of the network whose integrity is in question, if the deregulation of the CSU goes through, is the portion of the communications line that goes from the DDS hub to the user site.

Should a failure occur in this stretch of communications line or equipment, the procedure for testing and identifying the problem should continue to be to loop back the client site by means of the CSU.

The primary function of the CSU should continue to be a testing device, in addition to being a termination device.

Deregulation of the CSU probably means that AT&T no longer can control-site test the local loop.

But even if a non-AT&T CSU were to be used for testing and a failure condition were to be detected, I'm afraid that a line service call would not be placed.

Rather, the client would be asked to have the CSU checked by the ser-

ving company. This would probably require a minimum of six hours to 24 hours to have a third party or vendor dispatched for the purpose of checking the CSU.

Once the CSU was found to be functioning properly by a field engineer or technician at the site, then AT&T would be contacted and asked to dispatch someone to identify or repair the problem on the line, thereby creating an additional delay in repairing the DDS network.

The deregulation of this device, ensures the degradation of service in the way of mean time to repair, isolate and locate problems and dispatch service. Quick repair and high uptime have made DDS a premium service.

The parties that have lobbied for this deregulation do not have the best interests of the user in mind, but are more interested in the revenue of CSU sales to the consumer.

As a user, I would gladly pay the few extra dollars that would be saved to maintain this section of the DDS line under the umbrella and responsibility of AT&T.

I strongly urge that this deregulation be defeated so that the CSU can be maintained and used as a termination and testing facility for the DDS service.

Howard Fingerhut  
Network Manager

Shaw Data Services, Inc.  
Wayne, N.J.

*Computerworld* welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 860, Framingham, Mass. 01701.

## LECHT ON SCIENCE/Charles P. Lecht

## PCjr's First Halloween

In the somber streets of a quaking computer community, Halloween was dolefully celebrated this year by a heartrending lot of ghouls and ghoules. Still connected to the living by their own memories of life, a spectral pack of microcomputer companies past rattled their chips and chains upon the doornests of their colleagues not yet dead, showing the graying mouths of their empty trick-or-treat bags with uncomprehending misery to all who would look. What a wailing was there!

Mattel, Inc. moaned; Atari Corp. shrieked and tore its hair; Osborne Computer Corp. squinted blindly through its tiny screen while Computer Devices, Inc. scolded the black-bordered pages of a book composed solely of Chapter 11a Texas Instruments, Inc., in the lead, pointed the way along DP's Via Dolorosa with the index finger of its severed microcomputer arm.

Behind doors barred to that cold night, the remaining manufacturers stood rooted in indecision, not knowing whether to stop up their ears or heed the baleful plaints of their deceased brethren in hopes of learning how best not to join them prematurely. Taking its feeble pulse, Coleco Industries, Inc. wondered whether it would be here at all if God had taken as long to create Adam as it had. Digital Equipment Corp. had nightmare visions of a rainbow limned in liquidation shades of gray. Wang Laboratories, Inc. was driven nearly to distraction by the cries of the watchamacallit it'd kicked up in its dark cellar. Tremulous Tandy Corp. adopted a pique of irritation, silently praying

*"In the midst of the restless spirit horde lurked the weirdest and most thoroughly terrifying creature of them all: a big, blue meat-eating peanut. It stood out among the ghosts of what had been and what might have been by virtue of its yet-to-be quality. And what could be more frightening than that, for this was the wraith by which both the quick and the dead were haunted."*

that effected scorn could banish doubt from the troubled minds of its management. Apple Computer, Inc. secreted razor blades in the Macintoshes it had specially prepared to induce terminal indigestion in its competition and then, as the first, ghostly footfall was heard on its stairs, discomfitedly ate a few itself.

Abroad, the Japanese, long accustomed to spirits and especially familiar with the inscrutable American version of the spirit of competition, prepared to find themselves in the shadow of a new trade barrier or two, they realized that, whatever sweets they might dispense to these foreign devils, they'd be in for a trick or two just the same. The French wondered whether ghosts could be kept at bay with goodies. The Germans, misreading the situation, invoked inappropriate spells for the wanding off of vempires. An uneasy peace prevailed among the English and the commonwealth, as they prayed through the night in Anglican innocence.

## Meet-Eating Peanut

In the midst of the restless spirit horde lurked the weirdest and most thoroughly terrifying creature of

them all: a big, blue meat-eating peanut. It stood out among the ghosts of what had been and what might have been by virtue of its yet-to-be quality. And what could be more frightening than that, for this was the wraith by which both the quick and the dead were haunted.

As to its cry, above the bloodless howls of the others, it emitted the sustained end sanguinary howl of a thing that must be fed. This was such a sound as to freeze the blood of the entire global microcomputer community. This was the fearful herald of something whose prototype would materialize only a few hours later, on All Souls Day: the Peanut that would swallow the world, that had already swallowed a fair chunk of it at the moment of its concept — in fact, the unspunctured IBM PCjr.

Yet in the light of dawn, these graveyard apparitions vanished, as they always do, and there was little but smiles to be seen at the All Souls' Day christening of PCjr. The bells of Greet Cathedral of Mammon reverberated with the news. At the baptismal font, Wall Street analysts, consultants, members of the press, official and avocational soothsayers and dignitaries in pin-striped morn-

ing coats oohed and ahhed over PCjr's gummy fingers and large, tooth-filled jock-o-lantern mouth. Officiating blue-robed clerics gave ebullience to the doubters in the crowd, who thereupon professed themselves reborn in the hard, cruel-green light pouring through the windows.

Other micro makers prayed fervently ("O Lord, ASAP!") for a similarly blessed junior of their own. A chorus of software monks raised its voice in thanks ("Unto us a standard is given, the where-withal to make a liv'n, the Big Blue Standard is the Big Gold Standard to us") and dreamt of illuminating the characters of its program manuscripts in those two jubilant shades.

Then came the moment of truth for all assembled, well-wishers and otherwise. The sternest judges stepped forward to administer PCjr's final, public test of legitimacy. A PCjr floppy wafer was placed on the newborn's tongue; at once, PCjr's cat-crawling gave way to the flawless performance that only the child of so illustrious a parent could carry off. Hoanah! This was truly the progeny of the formidable PCjr. Financial analysts prepared early Christmas cards for mailing to investors, manufacturers and customers, ever courteous, showing smiling children disgorging PCjr's from their blue Christmas stockings.

And then PCjr vanished. In the still-warm swaddling clothes and packing materials, there remained nothing but a junior's newswatch read: "Happy Halloween! Buy long! See ya next year." (A documentalist's (Continued on Page 83))

## READER COMMENTARY/John Dillavou

## Programmers Can Write Good Documentation

Many data processing professionals erroneously assume that programmers are unable to write concise, intelligible and grammatically correct documentation. These same professionals also accept as fact the premise that documentation analysts are inherently poor programmers. Although there are abundant examples supporting both arguments, I have found many inconsistencies in this reasoning.

My thinking on this subject was reinforced recently when I read *Elements of Style* by Strunk and White (third edition; New York: Macmillan Publishing Co., 1979). This book lists rules and principles to follow for effective written communication. Many of these rules are equally applicable to computer programs.

While reading this book, I asked myself the following questions: If programmers can learn to write clear, concise and structured code, why shouldn't they be equally adept at writing clear, concise and intelligible documentation? And conversely, shouldn't good writers make good programmers?

Before answering these questions,

it would be instructive to compare good writing and good programmers.

Good writing and good programming have four common characteristics:

- **Organization.** A programmer who writes bodgepodge code is like a writer who rambles. In recent years, much emphasis has been placed on the use of structure charts and other devices for organizing a program. The structure chart is really no different from the outline used by writers. Both devices are techniques used to structure hierarchically one's thoughts before beginning the process at hand.

- **Conciseness.** Good writing demands a parsimony of words. Readers tire quickly of writers who are verbose or who use ornate or unneeded language. Unfortunately, programming verbosity is often overlooked. How often have you seen programs in which a simple "PERFORM VARYING" could have replaced six or seven lines of Cobol code?

- **Clarity.** The saying, "Programs are written to be read" has become a cliché. Yet it wasn't until the mid-

1970s that the technological advances in hardware finally enabled management to favor comprehensible code when they were faced with a trade-off between efficiency and understandability.

Although the writer of technical documentation does not face a similar type of dilemma, he is often faced with a decision of sacrificing readability because of time constraints or budget pressures.

- **Eloquent Style.** The reader of a computer program or a technical document is not concerned with the writer's state of mind. Instead, his attention is focused on understanding a particular function or process.

As with writing, there are no hard-and-fast rules governing one's style of programming. Programming styles often vary. Yet in all cases, a style that promotes clarity is preferred.

## Management's Role

Can programmers write quality documentation? Of course they can. It is a disservice to the career development of DP professionals to assume that their written communica-

tion skills are beyond redemption. Just as important, management is wasting hard-fought budgetary dollars if they hire technicians and documentation specialists for jobs that can be adequately performed by programmers.

Conversely, management should consider for a career in DP individuals who have displayed a flair for writing. Although they may lack the prerequisite technical skills, it has been my experience that they eventually become every bit as productive as career programmers.

Why are there so many examples of poor writing if good programmers are by nature good writers? I believe this phenomenon is due to a lack of foresight on the part of management. When management regards technical and user documentation as integral parts of the deliverable product, the quality of documentation will rise. If, on the other hand, documentation is treated as just another "box to check," the status quo can be expected to continue.

Dillavou is a manager within the management advisory services practice of a national accounting firm in Los Angeles.

## READER COMMENTARY

# How Microcomputers Can Aid in Applications

To get the most out of each person's dollar and hour, today's management information systems (MIS) director wants to improve applications reliability and achieve cost-effective development. Since the costs associated with maintaining a staff have become the largest element in most MIS budgets, any tool that can help to achieve these twin goals should be sought out and thoroughly evaluated. Some firms, through creative and sometimes aggressive utilization of microcomputers, have taken steps toward achieving these much sought-after goals of improved productivity and cost-effective de-

velopment.

A management consulting firm, for example, utilized microcomputers to develop software for its clients in the distribution and retailing industry even though the applications it was developing were intended for mainframe computers.

The consulting firm chose to use a micro for a number of reasons:

- Since it did not have any DP production requirements, it did not need a large CPU to process the large numbers of transactions typically associated with a production environment.

- Its applications software was

written in Ansi Cobol, which made it highly transportable and adaptable to a large number of mainframes from different vendors.

- Using a multiuser station micro, it was able to increase throughput while enhancing the productivity from its four-member programming staff.

- Its micro had both an 8-in. diskette and a Winchester disk. The Winchester disk allowed the firm to handle sizable volumes for a meaningful test of their applications, while the 8-in. diskette allowed the transportation of data and programs to and from clients. Further, when a

client did not have diskette capability, information on the diskettes could be transferred easily to 500 or 1,600 bit/in. tapes. This flexibility broadened the base of mainframe vendors' installations they were capable of supporting.

Thus, the consulting firm chose micros as a cost-effective (\$18,000 to \$25,000 less expensive when compared with comparable mini/mainframe hardware) alternative in an environment that was primarily devoted to developing application software. The application products it developed could be run, tested and prepared for installation in any client's environment.

With the micro, the firm could achieve higher productivity (estimated at a 12% improvement) with minimal technological complexity for its staff and, because of the controlled environment, develop highly reliable software while supporting client installations efficiently and cost-effectively.

## Second Example

As a second example, the MIS department of a large food retailer utilized micros to test and train new programmers. It also used program-generator software on the micro to develop data entry systems with user-oriented capabilities for heavy editing. These systems enabled the company to provide quick responses for important projects and to fulfill requirements on an interim basis until its traditional IBM CICS-based user data entry systems could be established. As an aside, all requirements for 3741s (key-to-diskette data entry machines) were eliminated.

The retailer conducted an extensive evaluation before deciding to give micros a role within the organization as an adjunct to, and in some cases a replacement for, its main DP resource. Ironically, the DP function, which initially had resisted the introduction of micros, evolved into its strongest supporter and user. Initially, it found a use for micros in the training and qualification of new programmers.

Because of their simple operation, micros proved extremely successful in overcoming the problems posed by the disparate backgrounds of new employees trained on different hardware. Since the programming skills (especially Cobol) of new employees could be confirmed rather quickly, the emphasis during training could then be on Job Control Language and other procedures for the specific hardware and software environment. This company believes that besides reducing staff training expenses by approximately \$12,000 per year, better screening and training has brought about an intangible savings because of reduced turnover.

However, the true value of the micros became evident as a result of the pressures resulting from staff turnover and the need to respond quickly to important and high-return projects. Because of substantial staff turnover, the MIS department had found it increasingly difficult to fulfill user requirements responsively through

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James M. Tharrington;

# Reliability, Development: Three Examples

the combination of data base and CICS in a mainframe environment.

Out of desperation, one of the systems supervisors, who acted as the microcomputer coordinator during the evaluation project, struck upon the idea of utilizing the micro and a program generator to develop data entry programs that could be implemented more rapidly than those normally developed. Much to his surprise, initial efforts proved so successful that this "interim" measure allowed a return to the 3741s, and users entered data on micros for their own tasks.

Shifting the responsibility by putting user-oriented data entry systems with heavy editing capabilities in the end-user environment produced greater responsiveness and, therefore, increased accuracy in the data entry function. The transmission of the edited information to the mainframe was initially performed via simple diskette reformatting and transfer via diskette reader, but ultimately was done through communications.

Thus, through innovative and somewhat fortuitous — use of micros, the firm was able to improve its users' responsiveness while increasing the cost-effectiveness of its operation (it estimated that over a three-year period, it saved \$75,000 above its investment in the micros by displacing the 3741s).

## Final Example

A company that develops applications software provides a final example of the practical approach toward the use of micros. This company understood the creative nature of its business and its employees and recognized that the process of writing software need not be constrained by time or location. Therefore, it provided each employee with a microcomputer for use at home. The firm believed its home micros would result in increased productivity.

First, since the micros were provided with a communications interface, the employees had access to the firm's mainframe, from their homes. Thus, they could be engaged in the creative process at any time.

Second, not only would the employees have access to the program code that they had already created, but they would be able to test these programs. Even without the communications interface, they would be able to create new programs or program

segments and compile these programs or segments, check for program grammar errors or even perform limited tests based upon the files available for testing.

Although the firm never attempted to quantify dollar improvements resulting from the micro availability, it did note improved flexibility

in staff utilization and better deadline management.

In each of these three scenarios, the approach to using micros was either innovative or nontraditional. These two concepts warrant emphasis because in the dynamics of the DP environment, the willingness to seek nontraditional answers to traditional

problems may not be just an innovative approach — it may be the only practical approach.

With the tremendous growth in the use of micros and the never-ending stream of new and better products on the market, it is less effective than ever to approach a DP problem wearing blind-

ers. Today's MIS management must learn to look lastly at problems and seek solutions outside the framework of the traditional — because in many cases, traditional solutions will no longer work.

Tharrington is a senior partner at Case and Co., Inc., in Stamford, Conn.

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## READER COMMENTARY

# The Ever-Changing World of DP Auditing:

Data processing auditing, as we know it today, is dying. The profession is going to evolve and grow, just as companies do. It cannot be held static. We must look at how it is changing, where it is changing, why it is changing and accept the fact that all institutions grow, develop, begin to wither and, finally, contribute to something new and different.

How has DP auditing changed over the years since it has been accepted as a separate area? It certainly has gotten more recognition and has moved up within the corporate hierarchy.

The DP auditor today is very likely to be a fairly senior individual in his company. But consider the individual who has risen to the top in DP auditing.

## Median Age

It is a safe assumption that the median age of DP auditors does not exceed 40. The 40-year-old DP auditor today is going to retire in the year 2006. Will he be doing what he is doing now for the next 25 years? If the answer is "no," then the skills, talents and access to information that DP auditing has provided him should serve as the basis for the rest of his career. The professional career of the 40-year-old DP auditor is not yet at the halfway point. He has a long way to go and is still setting the foundation for something else. The future, whatever it will be, will be different. The DP auditor had better be prepared to adapt his skills, technology and talent to new fields.

He will need credentials to establish his position as a corporate manager in the future. Today, the DP Auditor Foundation has established the Certified Information Systems Auditor (Cisa) program. The Cisa designation is a mark of professionalism, and the Cisa examination is proof of the fact that DP auditors are learned, well read, experienced and determined to do business in an ethical fashion. That sense of professionalism has served not only to build a base under the DP auditing profession, but to be a launchpad for greater remuneration.

The salary base for DP auditors is outstripping inflation. This indicates that the basic market value of the skills that DP auditors have is growing in real dollars. There is a sense that anyone with a B.A. in accounting can get a job in auditing. The disparity in salaries is creating internal divisiveness within many auditing departments. The fact that financial auditors and DP auditors have to be paid on different scales under the same management indicates that DP auditing is experiencing its own independent pattern of development and growth.

That growth is reflected in the number of people who consider themselves to be DP auditors. For all those at the bottom and at the middle levels of DP auditing, there are questions: Where do they go from there? How high up the ladder can they climb?

The 40-year-old DP auditor has seen many changes in the field, and

yet he has seen a lot of things stay the same. He has been out of college for 18 years. Perhaps he got his first job as an auditor and was sent to a DP course. A year later he found himself to be the first DP auditor in his company. For all his professional advancement, he is still the DP auditor — he just has more people working for him, auditing and controlling computer systems.

Where does he go now? And what of the people behind him — those people who came into the profession 10 years ago and who have experienced a steady pattern of career advancement? Today the manager of

DP auditing is standing in the way of not only the two people behind him, but of the four behind those two and eight behind those four and so on. How much growth can the field absorb? We are seeing maturity; the function of DP auditing cannot rise much higher than it has today in the auditing profession as currently understood.

A by-product of maturity has been the integration of DP auditing with financial auditing. There are many functions that the financial auditor was held back from doing, but is now being given a chance to do. The salary differential is, however, still

there. Take a financial auditor, teach him how to program a retrieval package, teach the auditor how to recognize systems controls and teach him how to review the development of a system to see if it is being done properly.

What has he become? A DP auditor.

He can move on and get a job as a DP auditor in a company in which the functions haven't been integrated yet. With more people coming into DP auditing pressing entry salaries from below, and the top position in DP auditing reaching maturity at the other end, where are salaries to

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Steven J. Ross

# How to Adjust to It, Prepare for the Future

go in the future?

I fear and foresee a leveling of the DP auditor's salary progression. Remuneration will not continue to exceed inflation. Already, the best and the brightest (and the youngest) in DP auditing are moving up and moving out into other control-oriented functions, such as data security or data base administration. If the boundaries traditionally drawn around DP auditing are accepted as the only definition there is, then the best and the brightest may be outside that boundary. On the other hand, rather than exclude the ones that have gone on in their careers, it is

better to extend the boundary.

The DP auditor must sacrifice a certain degree of audit independence in order to be part of the process of control. Already, many DP auditors help to design controls, auditability and security in information systems. When the auditor signs off on each stage of development, the loss of some of that independence accomplishes effectiveness. It is cheaper to put the controls into the system in the beginning than later.

## Skills Need Recognition

It is time to start recognizing valuable skills, skills that the community

needs, the company needs, the application needs and that have to be integrated into the development and operational processes. Whether those skills are called auditing, control or management is less important than the fact that the systems are auditable and controlled and managed.

There is not much about the future that is definitive, but one thing is definite about the past: It is over. To quote the immortal Satchel Paige, "Don't look back, something may be gaining on you."

Something is gaining on DP auditing — kids who are learning programming in grade school. It is the

financial auditor who is integrating DP auditing into the overall audit program. It is the data processor who does not want the auditor to tell him how to control a system and is developing a control specialty in DP. Each DP auditor should be prepared for change, because the future he predicts is not necessarily the one that is going to come. There are so many variables in this integrated world that no one can know exactly what is going to happen. It is so different today than we thought it would be. Be prepared for at least as much change in the future.

Ross is a principal of The Playman Group, Inc. in New York.

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## First Halloween For IBM's PCjr

(Continued from Page 79)

officials footnote pointed out that next year was only two months away.)

### Sigh of Relief

The imagined Christmas stockings collapsed, now stuffed with nothing more substantial than a gift certificate redeemable in 1984. Certain micro manufacturers released a deeply ambivalent sigh of relief; a stay of execution is not quite the same thing as a reprieve, after all. And would anyone remember their names between this day and the new year? The Big Event was over — for the moment.

Meanwhile, back in Rasking Ridge, Judge Green's incredible Shrinking Giant yawner and sank into untroubled sleep. Metamorphosing easily from one to 23 entities and back again with the rhythm of each nocturnal breath, it dreamt a dream of PCs, junior to senior, madly proliferating like the buckets and mops of the sorcerer's apprentice and all of them seeking to connect and talk to each other and to yet bigger systems on the giant's toiled networks.

As it dreamed on, a vision of the ultimate Halloween joke formed in its brain: The progeny of PCjr would be as minuscule and featureless as the single plug needed to connect consumers with the giant's own massively integrated systems digital networks, and the Big Blue Terror would distribute itself to death. Twenty-three sets of lips parted to form a smile shaped by years of experience at gobbling down such small fry as this.

Lecht is chairman of Licht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.



## READER COMMENTARY/Ted Singer

# DP Hackers Not Our Greatest Threat

In August, we were somewhat stunned by the Federal Bureau of Investigation apprehending a group of computer hackers. We heard that the data processing vandalism perpetrated by youthful members of the group reached into the depths of computer systems across the expanse of our nation. Wiping out student records, penetrating medical records of cancer victims, entering one of the systems at an atomic research installation is all somewhat terrifying to those of us who depend upon the integrity of data within our systems. Suddenly, computer security became a topic of national interest. Every

type of new media milked the story for everything it had. We are still being assaulted with articles, letters to the editor, accounts of hearings and possible prosecution involving the vandals.

It would seem that the serious threat we have from these "electronic vandals" (a term coined by Donn Parker, a DP crime expert) is the greatest threat we have to face in protecting our systems and the information they contain. Not so. Electronic snooping and manipulation has been a real threat for years, and it will continue to be a threat in years to come.

We have more serious threats from within and without. If we concentrate on denying access by hackers, we are only fooling ourselves. With sums in the hundreds of billions of dollars floating around from system to system every day, we are primary targets of professional thieves. Measures that prevent hackers from entering our systems, no matter how successful, will not necessarily keep professional criminals out. Organized crime must certainly have some of the best technical experts on its staff. With millions and millions of dollars at stake, perhaps even more, the professional criminal

can pump sufficient funds into technical research involving our security systems to cause crime to become such a threat that hacking becomes almost insignificant.

Worst of all, professional DP crime can be covered up in such a way that our auditors may not be able to detect it. We may find that our receipts and profits are much less than we expected; however, even with thorough investigation, we may not be able to find out why. Security systems dedicated to keep professional criminals out of our systems should certainly prevent vandalism by youthful hackers.

Penetration or message interception and manipulation by outside forces may not be our greatest threat either. It is our own people, our officers, managers and employees (even consultants) who are best equipped to commit computer-related crimes within our organizations. They are, first of all, most trusted by the rest of us. They have direct knowledge of our systems and how they operate. Many of these people are authorized users and have the capability to enter a system and create sufficient activity within the system to commit crimes. Even if duties and access limitations are segregated to the extent that a conspiracy involving several employees would be necessary to commit a crime, they have or can easily develop the close relationships necessary for such a venture.

## Personnel Relations

Crime by our own personnel is the most difficult to safeguard against. Mistrust has never been the basis for good employee relations that are so necessary to efficiency and productivity. Except for the partitioning of duties, personnel screening and monitoring are our main weapons. Good morale, pay and benefits and all the things that go with personnel relations can be a great assistance. However, all these things are delicate matters and must be achieved through diplomacy.

Realistic audit trails reporting all activity within the DP system are a must. To be effective, the audit trails should be examined by individuals other than the ones who would be in the best position to commit fraud. Actions taken to prevent and detect crime from within can also lead to minimizing negligence and abuse, which are probably the greatest threats of all to our DP operations.

It seems that the stress today is upon DP-oriented crime and vandalism; therefore, the other things are somehow put on the back burner while we attend to matters that are highlighted in the news. With the utter dependency we have on our DP operations for production, our jobs and the solvency of our corporations, we should never place anything pertaining to the protection of our computer system, its data and its uninterrupted operation on the back burner. Computer security, whether we like it or not, is essential to our very existence in the DP field.

Singer is a computer security consultant in San Antonio, Texas.

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## To Avoid Problems Later

# Consider Performance in Choosing DBMS

By Peter Búczé  
Special to CWI

Too often companies overlook data base management system (DBMS) performance when choosing a DBMS. What they discover is that in the early implementation

stages, when the data base is relatively small and there are few applications, performance is acceptable. But as the size and complexity of the data base increase and an on-line environment is added, DBMS performance is taxed.

The common solutions are to upgrade the hardware, which is expensive and not always successful; convert to a new DBMS, which is costly and time consuming; or abandon the idea of an integrated information system. If companies consider performance when selecting a DBMS, many problems can be avoided.

Two factors are important to understand:

- The on-line environment is infinitely more complex and consumes more resources than batch.

- An on-line system accessing a data base environment adds an even higher level of complexity.

The performance "trap" is subtle at first but worsens exponentially as data base/data communications (DB/DC) implementation progresses. Two key performance

*"Since there are no great breakthroughs in direct-access device speed expected during the 1980s, execute channel program measurements are perhaps the most important of all data base management system considerations."*

factors are priority job scheduling and inefficiency of direct-access devices.

Most computers use a priority job scheduling system to accommodate multiple users and processes. Typically, the operating system has the highest

priority, followed by the on-line system, the DBMS and various application processes. It is important to study the stages of competition for CPU cycles when the processing load is increased.

During stage one, only a few applications are processed on-line. The data base is neither complex nor large. The high-priority data communications software consumes perhaps 15% of the available CPU cycles, and the DBMS consumes approximately 20%. With another 10% allocated to the operating system, this leaves about 55% for application processing. Performance in this environment is excellent.

In stage two, new DB/DC applications slightly increase the impact on the DB/DC software processing environment. Data communications increases only 5% and

(Continued on Page 88)

## IBM Spreadsheet Targets End Users' On MVS, VM

WHITE PLAINS, N.Y. — IBM has announced a mainframe spreadsheet for its MVS/TSO and VM/CMS operating environments. OxyCalc reportedly allows end users to create, manipulate and save spreadsheets. The report required is entered directly on the display screen in the format desired, a spokesman said.

Features include an on-line tutorial, a help-programmed function key with Help panels to explain errors, extensive use of menus, full screen editing and the use of tab and program function keys to select spreadsheet areas.

The program is invoked by a single keyword on an IBM 3270 terminal, the spokesman said. The user can then select a tutorial on the use of OxyCalc, review program function key assignments, change any spreadsheet, chart or report file definition; operate utility functions such as selecting spreadsheet display colors, browsing or printing a previously created report file; or begin viewing a previously saved spreadsheet.

Spreadsheets can be as large as 132 columns by 32,000 rows. A set of arithmetic and logical operators and a set of mathematical, econometric, trigonometric and logical functions are provided to define value relationships.

OxyCalc was designed to utilize fully the color highlighting and graphics features of the IBM 3270 color display and 3287 color printer, the spokesman said.

The product is available for a one-time charge of \$8,000 from IBM's National Accounts Division at 1133 Westchester Ave., White Plains, N.Y. 10604.

## SAS Operations Research Package Unveiled for Large IBM Systems

CARY, N.C. — SAS Institute, Inc. has announced an operations research software package for large IBM systems.

Called SAS/OR, the product includes procedures for scheduling projects and solving linear optimization models. It features tools for planning distribution strategies, solving transportation and assignment problems, evaluating investment profitability and determining product mix, a spokesman said.

Procedures are based upon linear programming and other operations research techniques. The two principal procedures are Proc CPM (critical path method) for analyzing activity relationships and establishing effective schedules and Proc LP (linear programming) for solving linear

programming models and reporting on solution sensitivity.

SAS/OR also features Timeplot, a plotting procedure for displaying schedules. A macro to convert IBM Mathematical Linear Programming Extended data sets to SAS data sets is included.

SAS/OR is fully integrated with other SAS products and requires the base SAS product, the spokesman noted. The software runs on IBM 370, 30 series, 4300 series and compatible machines under IBM's OS, VM/CMS, DOS/VSE and SSS operating systems.

The first-year license fees are \$7,500 for SAS and \$3,000 for SAS/OR from SAS Institute through SAS Circle, Box 8000, Cary, N.C. 27511.

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## For Cobol Program Testing File Manipulation Tool Launched

SANTA CLARA, Calif. — XA Systems Corp. has announced Xpert, an interactive file manipulation tool that is said to reduce the time and difficulty of creating and manipulating files for Cobol program testing, maintenance and support.

The product dynamically interprets the existing Cobol layouts, without modification, to define and manipulate files, a spokesman said. This eliminates the need to redefine files in another language when creating, viewing, updating, extracting, reformatting and printing files.

Data-Xpert is menu-driven with full screen displays, user-defined programmed function keys and on-line help facilities.

The product supports sequential, partitioned data sets, Isam and Vsam files; allows editing or browsing using a formatted screen consisting of the Cobol layout and data fields; provides automated interfaces to Panosch Systems, Inc.'s Panvalet and Librarian products; prints the file contents in Cobol formatted model, three-line hexadecimal mode or single-line character mode; allows reformatting of file contents by provid-

ing specification of fields to be mapped from one Cobol layout to another; and allows selection criteria to be specified by entering the condition next to the Cobol names to select records.

Running under IBM's TSO/ISPF (Interactive System Productivity Facility), the product costs \$30,000 from XA Systems at No. 216, 3000 Scott Blvd., Santa Clara, Calif. 95050.

## Service Targets Mapics Users

NEEDHAM, Mass. — Marcam Data Systems Corp. has announced an on-line support service for IBM Mapics users that connects the user's IBM System/34, System/36 or System/38 directly to Marcam Data Systems' facilities via data communications.

The Solution On-Line Value Extension program permits the firm's technicians to use in-house display terminals as though they were local terminals on the user's host computer, a spokesman said.

Installation fees range from \$2,000 to \$3,000 plus actual travel expenses. Semiannual charges range from \$3,000 to \$3,600 and include the first 50 hours of service. Marcam Data Systems is located at 123 Highland Ave., Needham, Mass. 02194.

## Screen Generator Updated For CICS Users

ATLANTA — GT Software, Inc. has announced Release 4 of the company's Basic Mapping Support (BMS)/GT screen generator on IBM 3270-like terminals for IBM CICS users.

The company said that users of the package can design screens by keying in the data as they wish it to appear. BMS/GT supports line replication, full naming conventions, page building, header/trailers and the ability to retrieve any BMS-compatible map.

The new release is said to offer prototyping of screens, JCL management for on-line submission, production status maps and the capability to archive and restore maps selectively from a history tape. By invoking the prototyping facility, the company said, an end user can view the flow of a system before the programmer has written any code, allowing the end user to make any necessary changes. Through the production status capability, maps can be frozen in a read-only status to protect them from change or deletion.

A permanent license for the BMS/GT package, which is compatible with CICS 1.4 and higher releases, is available for \$5,500 for VSE and \$6,900 for VSI and MVS operating systems. GT Software is located at 1965 North Park Place, Atlanta, Ga. 30339.

## 'Secure/CICS' Extended To Support DL/I Data Bases

SUNNYVALE, Calif. — Boole & Rabbege, Inc. has announced an extension of its Secure/CICS data security facility to include support of IBM DL/I data bases to the field level. Secure/CICS is an on-line security software package that monitors and controls information across IBM's CICS environment.

Secure/CICS Release 5.0.0 provides DL/I-CICS security support for both IBM OS and DOS users and was designed to protect operators, terminals and transactions as well as to specify access

authorization.

The update protects system data bases and segments by name. In addition, the new release reportedly enhances the application interface facility.

Secure/CICS is priced at \$18,000 for systems running under the OS/MVS operating systems, \$13,500 for VSI and \$11,500 for DOS. Maintenance is provided free of charge for the first year and at 30% of the prevailing license fee thereafter. Boole & Rabbege is located at 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

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# TSX-Plus Update Boasts RT-11 Compatibility

NASHVILLE, Tenn. — Version 4.0 of the TSX-Plus operating system, featuring increased virtual address space, enhanced user security and compatibility with the latest version

of the Digital Equipment Corp. RT-11 operating system, has been announced by S&H Computer Systems, Inc.

The operating system, which is

said to allow RT-11 users to work in a multitier, multitasking environment, addresses up to 4M bytes of main memory on DEC PDP-11 systems that have either the extended bus or the 22-bit Q-bus together with the PDP-11/23 CPU.

In addition, TSX-Plus 4.0 provides the RT-11/M environment, which supports program logical address space. This allows programs as large as 35M bytes to run on the PDP-11 series if virtual overlays of arrays are used, a spokesman said.

The amount of memory available for a single program not using the virtual features has been increased from 56K bytes to 64K bytes.

TSX-Plus 4.0 supports up to eight logical disks per user, and access can

be restricted to specified logical disks at the time a user logs on. The files can be arranged either hierarchically or in parallel, with related files occupying neighboring physical disk space.

Compatible with Version 5.0 of RT-11, TSX-Plus 4.0 supports such DEC peripherals as the RA80 and RD51 fixed disk drives and the RX50 54-in. floppy disk drive. It also supports DEC's IND indirect command file processor, as well as RT-11's backup utility.

TSX-Plus 4.0 is priced at \$2,000 with an annual \$500 fee for support and the option to order upgrades. S&H Computer Systems is located at 1027 17th Ave. S., Nashville, Tenn. 37212.

## Inquire/Disclosure Link Accesses Financial Data Base

FALLS CHURCH, Va. — Infodata Systems, Inc. has announced the Inquire/Disclosure System, a link between its Inquire fourth-generation language and the Disclosure II data base from Disclosure Partners of Bethesda, Md.

Disclosure II provides Securities and Exchange Commission information on over 11,000 public companies, a spokeswoman said. Inquire/Disclosure is menu-driven, with menus for selection, reporting and utility functions. The data base contains historical financial information as well as searchable textual data such as descriptions of business, officers and directors, subsidiaries and management.

In addition to 20 standard reports, information can be accessed by a variety of search criteria, the spokeswoman said.

The system will be available in January. The full system, including the Disclosure II data base and the

full Inquire language, is licensed on an annual basis for \$32,000. Current Inquire users can purchase the front-end menu system for a one-time fee of \$5,000 and the Disclosure II data base for an annual fee of \$20,000.

Infodata is located at 5205 Leesburg Pike, Falls Church, Va. 22041.

## Cobol Debugger From UCSC Out For Burroughs

NEWARK, Del. — University Computing Services Corp. (UCSC) has announced the Interactive Cobol Debugger (ICD) for users of Burroughs Corp. large systems.

The company described ICD as an on-line, interactive facility that enables Cobol programmers to suspend program execution dynamically when a fault occurs. The package allows data structures to be inspected or modified using source-level Cobol names, and it permits repeated testing and debugging without recompilation.

ICD is said to feature Help functions that permit the programmer to inquire about structure names or source statements. It is activated through a one-time compiler option, and the compiler is identical to the standard Burroughs compiler.

ICD is priced between \$5,000 and \$10,000, depending on options, from UCSC, 254 E. Main Street, Newark, Del. 19711.



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\*Rainbow 100 is a trademark of Digital Equipment Corporation. LOTUS is a trademark of Lotus Development Corporation.

## Security Package Available for IBM's CICS

PLANTSVILLE, Conn. — TK Data Solutions has announced the Security and Terminal Operator Performance (Stop) software package, which the company said was designed as a security, performance and menu system for use with IBM's CICS Level 1.4 and higher.

All security entries are made on-line with the Stop system, thereby eliminating the need to modify and recompile tables or fixed code in programs, the vendor said. CICS remains active during Stop maintenance functions.

The package was designed to accommodate a unique password and identification for each terminal operator and reportedly allows personnel access only to the functions assigned

to them, a spokesman for the firm said.

The Stop system can be used to assign highly sensitive functions to a specific terminal or group of terminals.

An optional method of coding can be implemented to reduce operator entries, and the system also features encrypted security data, security sign-on field with darkened password field and a complete log of ter-

минаl sign-ons and security violations.

The DOS version of Stop costs between \$3,000 and \$5,000 from TK Data Solutions, through P.O. Box 392, Plantville, Conn. 06479.

## Don't Overlook Performance of DBMS

(Continued from Page 85)

data base increases only 10%, so that 40% of the CPU is available for application processing. Response time is still good.

In stage three, more and more applications have been added to satisfy growing end-user demand. But the results are devastating to the system. As the combined DB/DC usage has

increased by about 60% (80% vs. 50%), applications processing is reduced to one-fourth its previous level (10% vs. 40%).

At this point, any slight increase in existing DB/DC applications would degrade performance seriously. For example, a 10% increase to 33% and 55%, respectively, would reduce application processing avail-

ability to 2%.

It is important to recognize that this is merely an example. In reality, the vast majority of DB/DC users cannot accurately predict the impact of new applications on performance and CPU utilization until the applications are brought up in a production mode.

It is also important to consider the detrimental impact of nonprocedural software such as query system and application development products. They consume considerably more resources.

There is a need at this point to increase CPU power. But since the leverage is so stacked against application processing, any power upgrade is just a temporary solution. As development resumes, upgrades must be made faster and in bigger leaps.

A better approach is to correct the cause of the problem. For example, had it been possible to reduce the DBMS usage from 50% to 25%, the additional availability could go directly to more application processing.

This 25% increase in availability could produce a performance increase similar to a substantial increase in computer power. Even a small performance advantage in DB/DC software can produce a substantial increase in overall performance.

Since there are no great breakthroughs in direct-access device speed expected during the 1980s, ex-ecutive channel program measurements are perhaps the most important of all DBMS considerations.

### 'Hybrid Relational' Tech

With the new technology known as "hybrid relational," values inherent within the data itself enable retrieval of associated records without using pointers or indexes. Reduced pointer and index maintenance overhead dramatically improves performance.

Main memory processing speeds, already much faster than direct access, are expected to continue to increase dramatically. Therefore, the best way to achieve a balance between DBMS performance potential and the current capabilities of data communications software is to move more of the data base accessing into main memory. This is not the logic needed to retrieve the data, but larger percentages of actual data of interest.

Further, if it were possible to reduce the number of pointers, indexes and tables stored and maintained on direct-access devices, overall throughput and performance would increase substantially. Thus, the two most critical factors in high performance systems are a large percentage of "in-memory buffer hits" and a substantial cut in pointer logic.

Breeze is a product manager at Cincom Systems, Inc. in Cincinnati, Ohio.



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# Datamate Offers Report Writer for VAX-11s

TULSA, Okla. — Datamate Co. has announced the Zword/36 report writer for the

Digital Equipment Corp. VAX-11 series of supermini-computers operating in the

VMS environment.

The vendor said that Enquiry uses an English-style

language to access user files through a data dictionary, and the package allows users to define their own English names for the data names in their files. The package features standard mathematical functions, and it allows for complex conditional statements from which the user may count, total and subtotal fields, a spokesman said.

The package's output can be printed or displayed and

is said to be formatted automatically in the program. A bi-level security system reportedly gives administrators the ability to choose the interactive capacity of each user on a report-by-report basis.

Enquiry is priced at \$4,000 plus installation, the vendor spokesman said, from Datamate at Department CWA3, 4135 S. 100th East Ave., Tulsa, Okla. 74146.

## 'Zword/36' Bows for System/36

SAN RAFAEL, Calif. — Accusoft, Inc. has announced the Zword/36 software package, which the company said offers standard word processing functions to users of the IBM System/36 small business computer.

Zword/36 is said to allow users to insert information from the System/36 data base into documents and allows data from any file to be merged without reformatting. The system offers standard word processing functions such as user-definable tabs, global search and replace and automatic text wrapping and page numbering.

The vendor said the package allows users to merge

data by selecting from a menu of instructions. Zword/36 utilizes the full screen and can support line lengths of up to 132 characters. Users can access any section of the document by line

number or through a scrolling function.

The package is available for \$3,000, which includes a one-day training session, from Accusoft, 126 Alto St., San Rafael, Calif. 94901.

## Planning Aid Announced For Wang VS

RICHMOND, Calif. — Soft Pro Systems, Inc. has announced the Project Management System for use with the Wang Laboratories, Inc. VS computer series.

According to the company, the package is a project planning and management system that is designed to help project managers plan resources and measure actual resource status against planned schedules. The Project Management System is based on the critical path method analytic technique and is written in Cobol.

The package is said to feature on-line, task maintenance, project schedule reports by work day or date, actual man-hour reports, calendar maintenance and resource planning maintenance. Reports include manpower planning reports and task source analysis, individual resource analysis and project task resource analysis reports.

The system is priced at \$5,000 per CPU copy from Soft Pro Systems, 4121 MacDonalld Ave., Richmond, Calif. 94803.

## NCR COMTEN INTRODUCES ITS NEW 9600 BPS MODEM. BRILLIANCE RUNS IN THE FAMILY.



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# Program Processes Employee Medical Claims

**NORTH HOLLYWOOD, Calif.** — A system for the automated processing and administration of employee medical expense claims has been announced by California Interactive Computing, Inc. Called Dimed, the program allows partially self-funded, self-insured or self-administered employers to handle medical, dental, vision care and prescription claims.

Dimed includes a mix of on-line and scheduled processing program modules. The scheduled portion carries out a series of scheduled processing tasks and generates appropriate reports. On-line modules provide real-time inquiry and the development of special forms. In addition, optional modules can be provided for special functions such as the generation of personalized

form letters.

Information is entered via a video display terminal, using masks or menus on the screen. A data base management system and data dictionary facilitate the functions required for the administration, updating, storage and retrieval of claims and related data, the company said.

Processing functions of Dimed include on-line verification of eligibility cover-

age and claim status and computation of claim payment based on interpretation of plan coverage.

The Dimed system can generate personalized claim correspondence, as well as print checks, drafts or vouchers, the company noted. In addition, it can provide management reports. A plan-modeling module allows a user to change figures, such as deductibles, to

make "what if" comparisons.

Available for use on a range of micro, mini and mainframe systems, the basic Dimed package is priced from \$18,000 depending on modules selected.

More information is available from California Interactive Computing, 12517 Chandler Blvd., North Hollywood, Calif. 91607.

## Solids Model Available For HP 9000

**ATLANTA** — Calsoft, a three-dimensional solids modeling program from Caltronic Corp., is now available for use on the Hewlett-Packard Co. HP 9000.

Designed for implementation at the level of engineering design and development, the solids model may then pass automatically to analysis, computer-aided design and manufacturing and publications systems.

Originally developed on a Digital Equipment Corp. PDP-11/23, Calsoft makes solids modeling possible on a number of 16- and 32-bit systems, the company said.

Purchase price for Calsoft is \$30,000 for a perpetual license. Lease terms are available to purchase are available from Caltronic, Suite 800, 120 Ralph McGill Boulevard N.E., Atlanta, Ga. 30308.

## File Tool Out For PDP-11

**DUBLIN, Ohio** — System Performance House, Inc. has announced the user file directory (UFD) optimizer, a record-like utility for Digital Equipment Corp. PDP-11 minicomputers under the RSTS/E operating system.

In addition to sorting on access or creation date in forward or reverse order, UFD sorts the most important files in the directory to the front of the directory.

The product costs \$250 for a one-time license from System Performance House, 5522 Loch More Court, Dublin, Ohio 43017.

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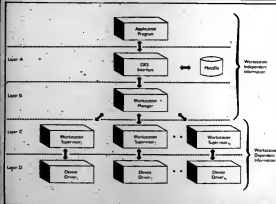
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Nova\*GKS System Architecture

Nova Graphics International Corp.

## Nova\*GKS Graphics Tool Incorporates GKS Standard

AUSTIN, Texas — Nova Graphics International Corp. has announced Nova\*GKS, a graphics application development tool that incorporates the International Standards Organization's GKS graphics software standard.

Applications developed under Nova\*GKS are device-independent and are transportable among several types of hardware, a spokesman said. GKS specifies a library of standard software programs that provides an interface between an application program and any number of graphics I/O hardware devices. It provides a consistent interface to application programs, giving the applications

programmer a "common graphics model and standard syntax."

The product uses a multilayer architecture that consists of the GKS interface, a workstation manager with picture storage independent of the graphics device and one or more workstation supervisors, each handling a specific graphics device.

The system can be distributed between a host computer and a microprocessor-based graphics workstation in eight possible configurations. All portions of the system can operate on either the host or the workstation. Nova\*GKS can be tuned to implement specific features of the hardware devices of various manufacturers, the spokesman said.

The Fortran implementation of Nova will be available in January 1984 at a cost of \$7,500. Nova Graphics is located at 1015 Bee Cave Woods, Austin, Texas 78746.

## Fusion/1 Update, Fusion/2 Debut For System/34

LARKSPUR, Calif. — Fusion Products International, Inc. has announced the availability of Version 5.0 of the Fusion/1 information retrieval system and the Fusion/2 file management system for the IBM System/34.

The enhanced version of the two productivity tools now provides an IBM Personal Computer a retrieval interface that links System/34 files to personal computer programs such as Lotus Development Corp.'s Lotus 1-2-3, Visicon's Visicalc and Ashton-Tate's dBase II. It also allows user-defined output files in Ascii, Ebcidic or DIF formats including the 'virtual diskette facility from IBM.

Other enhancements to the Fusion systems include color attribute support, retrieval formatting that permits full user print position control, support of nonstandard paper form sizes, concurrent sort/select on any field in a retrieval over primary and nonprimary files and total and subtotal break calculations.

### Provides Improved Support

In addition, the latest version provides multiple data dictionary support, improved file maintenance editing, improved file maintenance capacity and improved documentation and on-line help, according to the company.

Fusion/1 and 2 can also be integrated with Fusion/3, a financial modeling and electronic spreadsheet system, the company noted.

Licensed users of Fusion/1 with an active maintenance contract may upgrade to Version 5.0 at no charge. Single-copy licenses for Fusion/1 are \$3,500 with multiple-copy discounts available. Fusion/2 single-copy licenses are \$2,000 if bought individually and \$1,000 if purchased with Fusion/1. Fusion/3 is \$2,500 for a single copy. Fusion Products International is located at 900 Larkspur Landing Circle, Larkspur, Calif. 94939.

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## Tems Automates Recordkeeping Communications Equipment Manager Debuts

NEW YORK — Commercial Software has announced the Telecommunications Equipment Management System (Tems), a product said to automate the recordkeeping activities of a large telecommunications system.

The product runs on Digital

Equipment Corp.'s VAX-11 superminicomputers.

Created to supplement much of the recordkeeping previously assumed by the Bell operating companies, the product provides detailed information about installed telecommunications equipment and services, pro-

vides information by which to evaluate rate increases, analyzes competitive proposals and reviews deployment of new equipment.

An order writer sees a "picture" of the phone, which includes organizational data as well as equipment information, a spokesman said. The system alerts operators of potential errors through the work-order creation process. For example, if an order attempted to disconnect a line attached to other instruments, a warning would flash, the spokesman said. When necessary, Tems automatically translates the equipment information into Universal Service Order Codes.

The system maintains pricing information for both installation and ongoing charges, the company claimed. It also maintains a series of reports indicating pending orders, orders on hold and orders that should have been completed. An inventory is automatically updated as orders are completed.

Tems provides two mechanisms for the reconciliation of vendor bills. It supports the cost allocation of telephone and telecommunications equipment to user departments and provides detailed inventory reports.

Tems costs \$55,000 from Commercial Software at 420 Lexington Ave., New York, N.Y. 10170.

## DOS Version of JCLflow Receives Enhancements

DOWNS GROVE, Ill. — Consumers Systems Service Group, Inc. has announced a series of enhancements to the DOS Version of the company's JCLflow application documentation software package.

They include simplified execution Job Control Language to reduce system implementation modifications, expansion of the program file, to include the identification of Copy books, Sort and Ideams (IBM's Vsm file utility program), control card review logic to correct documentation of those utility programs, a report function that produces a cross-referenced list of program Call and Copy books and automatic replacement of program information on the program master file.

The company said the JCLflow system provides an automated tool with which users can develop a standardized library of systems documentation. A DOS version of JCLflow is also available, and both the OS and DOS versions are priced

at \$7,500 from Consumer Systems, 1100 31st St., Downers Grove, Ill. 60515.

## Mailer's Choice Splits Files Into Groupings

LOMBARD, Ill. — List Processing Co. has released Mailer's Choice, a sorting, addressing and printing system that can split an address file into

99 major groupings, each including up to all records from the user's file. Mailer's Choice can print mailing labels, bag tags and sack, tray and pallet summaries and reports in U.S. Postal Service-approved formats. Printed one split at a time, mailing labels can be separated for various publications and multiple versions of the same publication, the company explained.

Users of Mailer's Choice can obtain preset discounts on a variety of Zip Codes and carrier route codes, as well as "firm package" multiple second-class pieces for the same address as one piece.

Other features of the system include the ability to generate a file of label images ready for ink-jet printing, adjust sack weights, alter the contents of fixed fields within records, duplicate mailing records and generate match codes.

Mailer's Choice operates under DOS or OS on an IBM 4300, 370 or equivalent system and is available for \$17,500 under a perpetual license agreement. List Processing can be reached at 555 Waters Edge, Lombard, Ill. 60146.

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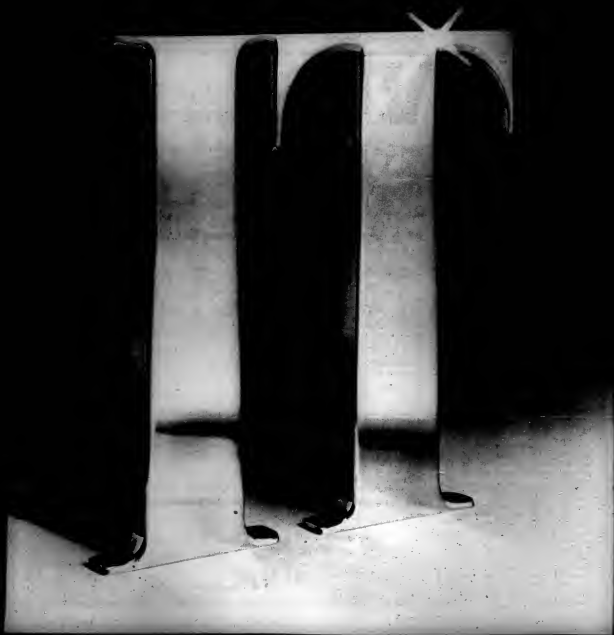
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## 'Design Graphix' Fits RSX-11M

BATON ROUGE, La. — Engineering Systems Corp. recently announced a computer-aided design and drafting software product for Digital Equipment Corp.'s RSX-11M operating system.

The product, Design Graphix, reportedly includes a three-dimensional data base, multiple pens and multiple layer drawing construction, geometrics, user-definable symbols and figures, and graphics and text editing.

Other features include user-definable menus, command file processing, a mac-

ro programming facility and various utilities, according to a spokesman. The product reportedly links with Fortran programs and offers Teach, an on-line programmed instruction course, and a Help facility to speed learning by in-house personnel.

Software options range from single workstation versions to multitasking versions supporting multiple workstations. The system reportedly supports a variety of peripherals such as graphics displays, digitizers, plotters and magnetic tape.

The product is available for under \$20,000 from Engineering Systems, P.O. Box 80318, Baton Rouge, La. 70898.

## 'Maps/AP' Designed For VAX-11

PALO ALTO, Calif. — An interactive accounts payable management package with cash management features, designed for use on the Digital Equipment Corp. VAX-11 superminicomputers, has been announced by Ross Systems, Inc.

Maps/AP handles such tasks as payables processing, check writing, vendor information, cash management, inquiries and reports. Designed to be integrated with other Ross software, Maps/AP can be used with the general ledger/financial management package, Maps/GL, to update payables automatically to the general ledger and provide a general ledger distribution by multiple account structures.

Other features of Maps/AP include user-defined reports, automatic allocations by vendor and a vendor directory, as well as a distribution preview, which allows the user to look at any detail combinations in any order of the five possible elements that make up the general ledger account code.

Maps/AP will be available in January at a cost of \$15,000 to \$20,000 depending on the VAX model.

Ross Systems is located at 1860 Embarcadero Road, Palo Alto, Calif. 94303.

## Course Supported By Video

WESTWOOD, Mass. — Cullinet Software, Inc. has announced a video-based training series to complement the course offered at its National Education Center.

Cullinet users can acquire video-based training courses on the basic components of IDMS: Integrated Data Dictionary; Application Development System/Online; and IDMS-Data Communications/Universal Communications Facility.

Course prices range from \$4,000 to \$8,500, and all five are available for \$30,500; annual renewals are available for 10% of the purchase price. Cullinet is located at 400 Blue Hill Drive, Westwood, Mass. 02090.

## 'Word-11' WP Enhanced For VAX-11 Under VMS

ANAHEIM, Calif. — Data Processing Design, Inc. (DPD) has announced an upgrade of its Word-11 word processing package for Digital Equipment Corp.'s VAX-11 superminicomputers under the VMS operating system.

In Version 3.0, Word-11 is converted from Macro-11 mode to Macro-32 mode, which reportedly eliminates the need for it to run in a compatibility mode and provides for faster operation. The package also provides expanded management and

support for additional output devices, including laser printers, according to a spokesman.

Features include an advanced system management utility, scientific character set support for DEC's VT100 terminals and Diablo Systems, Inc.'s 630-ECS printer.

Version 3.0 supports DEC's VMS Version 3.4 and will be available in late 1983. It is priced at \$9,500 for large VAX systems and \$6,500 for small VAX systems. DPD is located at 1400 N. Brasher, Anaheim, Calif. 92807.

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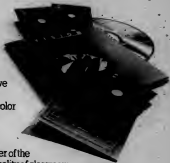
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## Relational DBMS Available For DEC Professional Models

BETHESDA, Md. — Contel Information Systems, Inc. has announced that its RT-File relational data base management system (DBMS) is available for the Digital Equipment Corp. Professional Computer 325 and Professional Computer 350 systems.

At the same time, the company introduced an RT-11 emulation system, called Virtual RT-11 (VRT), for users of VAX-11 computers.

RT-File now provides Professional Computer 300 series users with menu-driven, forms-oriented utilities that are paid to enable nontechnical personnel to perform tasks such as sorting files, performing calculations and selecting records.

The RT-11 version of RT-File has been bundled with the PRO/RT-11 operating system, which supports both runtime applications and program development. Virtually all RT-11 single-job applications and utilities will run under PRO/RT-11, according to Contel. The PRO/RT-11 and RT-File package, including an RT-11 license, costs \$1,500.

VRT includes a Virtual Exchange Program, which allows users to move files between RT-11 and Files-11 formats. VRT programs may access files in both formats, Contel noted.

VRT is priced at \$1,750. Contel is located at 4330 East-West Highway, Bethesda, Md. 20814.

## IBM Micro Nets Get DBMS

SANTA CLARA, Calif. — A relational data base management system (DBMS) designed for local-area networks of IBM Personal Computers has been announced by Software Connections, Inc.

The product, LAN:Datastore, supports a variety of local-area networks and offers end-user security and record-level locking, a spokesman said. Security is defined at the field and record levels, and users can be deleted in ability to read, update, delete and add records. Audit trails are provided.

Help messages and menus are provided for novice users, but can be bypassed by function-key and mnemonic-driven commands, according to the vendor spokesman.

A full screen editor is provided for screen printing.

The data base handles up to 16MB bytes of storage and does not limit the user to a fixed number of records. Each record can be as large as 16K bytes and can contain more than 500 fields. A report writer is included.

The single-user version costs \$495, and the network version costs \$1,945 per Personal Computer, according to the vendor. More information can be obtained from Software Connections, at Suite 17, 1800 Wyatt Drive, Santa Clara, Calif. 95054.

## Trademark File Now Available On Dialog

PALO ALTO, Calif. — Dialog Information Services, Inc. has announced that the Trademarkscan data base of more than 600,000 registered U.S. trademarks is now available through the company's Dialog Information Service.

According to the company, the Dialog service is available through word processors and microcomputers with communications capabilities and offers more than 150 data bases containing 50 million items of information.

The Trademarkscan data base, compiled by Thomson and Thomson, Inc. of Boston, Mass., reportedly tracks active trademark registrations of the U.S. Patent and Trademark Office.

Through Dialog, a user can access Trademarkscan and perform a trademark search immediately, according to a spokesman for the firm. The data base is designed to allow researchers to scan by trademark, owner, a description of the product or service or through a prefix, suffix and letter string searching feature.

The company said there is no subscription fee or minimum usage charge to access Trademarkscan, and charges will be based on the \$85 per connect hour fee.

Additional information is available from Dialog-Marketing, located at 3660 Hillview Ave., Palo Alto, Calif. 94304.

## Adage 3000 Gets Program Tool

BILLERICA, Mass. — Adage, Inc. and Intermetrics, Inc. have announced a high-level programming system for use with the Adage 3000 Color Raster systems on Digital Equipment Corp. minicomputers.

Adage 3000, developed by Intermetrics, is reportedly styled after the C programming language and supports compilations of microcode modules for the Adage 3000 bipolar BP532 microprocessor.

Spokesmen for both the companies said the package allows subsequent link-editing to produce load modules for microprocessors that can be downloaded directly after compilation.

The package is available for \$7,500, the vendor said. Adage is located at One Fortune Drive, Billerica, Mass. 01821.



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## Tool for Oil, Gas Industry Runs on Datapoint Processor

DALLAS — Hal Systems and Services, Inc. unveiled a software package for the oil and gas industry that runs on Datapoint Corp. processors.

The Lease Management System includes a separate contract section that can be linked to leases or individual owners, a spokesman said. Users can also specify multiple owner sections per lease, unlimited special obligations and a shut-in royalty cycle to pay owners automatically. Leases can be designed from up to 17 separate information sections. Ten different budget reports, three separate formats and up to 99 different reports can be defined, the spokesman noted.

The Lease Management System costs \$12,500 from Hal Systems and Services at 14840 Landmark Blvd., Dallas, Texas 75240.

## 'Catsoft' Available on HP 9000

ATLANTA — Catronix Corp. has announced that its Catsoft three-dimensional solids modeling program is available on the Hewlett-Packard Co. HP 9000 desktop computer.

Implemented at the level of engineering design and development, the solids model reportedly

SANTA SUSANA, Calif. — Ventura Computer Systems, a division of Tri-Delta Corp., has announced Superzap/38, which is described as a productivity aid that enables direct access of records in any data base file on the IBM System/38.

may pass electronically to analysis, computer-aided design and manufacturing, publication and manufacturing systems.

The purchase price is \$30,000, with lease terms available from Catronix at Suite 800, 120 Ralph McGill Blvd. N.E., Atlanta, Ga. 30308.

## Tool Out for System/38 Users

Once the system has verified that System/38 security has been cleared, records can be requested for display, and records in logical and keyed physical files can be located by key. Once a record is displayed, a user may scroll forward or backward through the file, modify the displayed record in character or hexadecimal mode and rewrite it to the disk or delete it, a spokesman said.

Superzap/38 allows programmers to modify test file data and provides direct access to disk information. The package is available for \$730 from 1411 Kuehner Drive, Santa Susana, Calif. 93063.

## Financial Aid Introduced For DG Products

SEATTLE — Minicomputer Modeling, Inc. has announced a financial modeling system for Data General Corp. Eclipse, MV, Micro Eclipse and Desktop Generation computers running DG's AOS and AOS/VS and Microsoft, Inc.'s MS-DOS operating system.

Data Model is a menu-driven system for financial modeling and spreadsheet management. Using a virtual spreadsheet design, Data Model reportedly allows an unlimited number of individual spreadsheets to contain 500 columns and 30,000 rows. Multidirectional consolidation capability permits any number of consolidations to be performed in any direction, the company said.

Data Model includes data projection and built-in financial routines. A time-slice reporting feature allows users to summarize and print spreadsheet rows or columns in any order, perform mathematics at report time and duplicate any current report forms, the company noted.

Permanent license fees for Data Model start at \$1,295 from Minicomputer Modeling, Suite B, 1307 Queen Anne Ave. N., Seattle, Wash. 98109.

## Report on MRP Gets Updated

ESSEX JUNCTION, Vt. — Manufacturing Software Systems, Inc. has published an updated version of the company's research report on guidelines for a closed-loop Material Requirements Planning (MRP) II software system.

Titled "MRP II Standard System," the publication also includes evaluations of 25 of the most popular of these packages. The guide is said to offer information on developing or modifying MRP II software in-house. The vendor said the findings contained in the publication were based on the experiences of successful MRP II user companies.

The "MRP II Standard System" is available to owners of the older version for \$125 and to new customers for \$800 from Manufacturing Software Systems, Publications Department, which is located at 85 Allen Martin Drive, Essex Junction, Vt. 05452.

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## Business Articles Summarized In Data Base

LOUISVILLE, Ky. — Data Courier, Inc. has announced ABI/Inform, a business data base available to the financial community through Innerline, an electronic management support service which is a co-venture of the American Banker and the Bank Administration Institute.

The data base contains 200-word summaries of articles appearing in more than 590 business and management publications worldwide. Users can do banking-related searches, scan several months of the file on additional topics, such as data processing, marketing, human resources and industries; or order full-text articles of the summaries.

The service price for the data base is \$1.00 per minute connect charge and \$6.50 for each full-text article ordered off-line.

Further information is available from Data Courier, 620 S. Fifth St., Louisville, Ky. 40202.

## Inquiry System For Banks Runs On System/34, 36

FRAMINGHAM, Mass. — An on-line inquiry system for consumer bank accounts maintained on IBM's System/34 and System/36 was recently announced by W. A. Wills Associates, Inc.

The Willing system is presently operational on the System/34 and can be readily converted to the System/36, according to a spokesman. It is written in RPG-11.

The system reportedly provides current transaction history since the last statement cycle for loans, savings and various checking and savings accounts such as Now and Super Now accounts, along with automated teller machine transactions.

In addition to daily posting of debit memos and informational messages, the system reportedly calculates daily collected balances, displays daily cumulative interest on Now accounts, reflects payoff amounts on loans and clubs and maintains delinquent history information.

The system is priced at \$20,000 from Wills Associates, which can be reached through P.O. Box 449, Framingham, Mass. 01701.



Consider It Character Assessment, Higgins — the Computer Is Tying With You.

## 'FM/3000' Upgraded for HP Micro Access

BURLINGTON, Mass. — Computer Solutions, Inc. has announced that its FM/3000 line of productivity software has been upgraded to allow access by the Hewlett-Packard Co. Model 150 personal computer acting

as a terminal on the HP 3000 series minicomputers.

## Connect Charges for 'Delphi' Cut

CAMBRIDGE, Mass. — General Videotex Corp. has implemented a 37% reduction in its daytime connect charges for individual users of the company's Delphi information and communications utility. It has also eliminated the 50% surcharge formerly levied on users communicating at the 1,200 bit/sec rate.

The hourly charge for basic service to individual users not under volume contract has fallen from a

maximum of \$25.50 to \$16. Also, the hourly rate for organizations that have contracted for \$200,000 or more of connect time has been lowered from \$19.50 to \$12.

Delphi is said to enable subscribers to send electronic mail messages and to exchange information via bulletin boards or conferences. It is available for a one-time fee of \$49.95 from General Videotex, 3 Blackstone St., Cambridge, Mass. 02139.

or for use in conjunction with application programs currently available for the HP Model 150 personal computer. The FM/3000 and FM/3000 Plus packages include accounts payable and receivable, general ledger and sales order processing.

The package's manufacturing module includes inventory control, purchase order control, materials requirements planning, capacity planning and shop floor control functions. FM/3000 Plus' marketing module — Salespower — is said to provide a data management structure for customer information, sales campaigns and lead and quote activity.

FM/3000 costs \$40,000, and FM/3000 Plus costs \$55,000 from Computer Solutions, One Burlington Woods, Burlington, Mass. 01803.



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have to fly across the country to seminars, you save big money, and because Keeping Current video presentations fit into normal work schedules, you save valuable time without interrupting the flow. Choose presentations that zero in on MVS/XA, IMS/VS, X.25, CMS/SP, NCP, MVS/SP, ACF/VTAM, or VSAM, and get a new grasp of your operation. First time customers receive the first presentation at half price. So don't wait. It's amazing how much there is to learn about mainframes. Start Keeping Current today.

For more information, call Amdahl Education at 800-538-8460 ext. 6393. Within California call (408) 746-6393.

the amdahl phenomenon

In October, 1978, a company was formed expressly to build one product: A main frame computer that would improve the mainframe that caused the trouble at the time. Today, the company is an international success story, a phenomenon.

## Engineering Data Base Out, Provides Microfiche Files

DENVER — An engineering data base providing regularly updated microfiche files has been announced by Inacom International.

Tech-Doc reportedly contains information on more than 400,000 industrial products and is updated every 60 days. Also announced was Micro-Index, a microcomputer-based indexing program providing access to the location of data stored on the data base.

Information contained in Tech-Doc files and Micro-Index is divided into 18 categories: electronic components; electrical components; computers; communications equipment; instruments/controls; motors/en-

gines/turbines; compressors/blowers/fans; mechanical components; fasteners; fluid system components; metallic materials; nonmetallic materials; plastics/resins/elastomers/rubbers; adhesives/sealants; lubricants; surface treatments; chemicals; and services.

Subscribers can order all 18 files for \$4,500 a year or tailor the subscription to meet their needs. Micro-Index is provided on hard disks or floppy disks at 5% of the Tech-Doc subscription price for use with microcomputers using Microsoft, Inc.'s MS-DOS operating system. Inacom is located at 4380 S. Syracuse St., Denver, Colo. 80237.

## Mumps Users Publish Primer

COLLEGE PARK, Md. — The Mumps Users Group has published the 122-page "Mumps Primer: An Introduction to the Interactive Programming Language of the Future."

The primer features 19 chapters with examples that introduce the reader to increasingly sophisticated principles and applications. Early segments focus on developing an understanding of how Mumps differs from Fortran and Cobol, and later chapters explore the language's ability to manipulate textual strings, plus a feature called "indirection" that permits the dynamic creation of executable code.

The primer covers concepts relating to operations on numeric values and operations on strings and commands before advancing to specific

Mumps capabilities, such as the ability to create global variables and the use of string subscripts.

The primer is available for \$12, plus \$1.50 for shipping from the Mumps Users Group, Suite 306, 4321 Harward Road, College Park, Md. 20740.

## Design Package Debuts for Use With DEC RSTS

FREDERICTON, N.B. — Solutions Deck, Inc. has announced the SD Design software package for use in the Digital Equipment Corp. RSTS operating system environment.

According to the vendor, the package provides a method to design and document proposed new programs or changes to programs. It is said to allow programming in English via a terminal, and it can produce program narratives, screen or report layouts and suggested program outlines to the code section level which can serve as coding guides.

The SD Design package reportedly also features an option to cross-reference and classify usage of all data names. Screen and report layouts, along with the master and transaction program narratives, can be used to produce a static prototype of the proposed system. It is said to be a subset of the company's Solutions Deck series of productivity tools.

SD Design is priced at \$795 from Solutions Deck, P.O. Box 684, Postal Station A, Fredericton, N. B., Canada E3B5H4.

## DBMS Update Announced For DEC Users

CAMBRIDGE, Mass. — Software House, Inc. has announced Version 116 of its System 1022 data base management system for users of Digital Equipment Corp. mainframes.

Enhancements include two features to integrate separate data files. A COLLECT command gathers any number of files of the same type to appear as one large data set. A Join operator links dissimilar file types across common field values, a spokesman said.

A typical license costs \$32,500 for the Decsystem-2060. Software House is located at 1105 Massachusetts Ave., Cambridge, Mass. 02138.



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The 1700 is compatible with the 3278 model 2. Yet its footprint is only 13 x 12 inches (24% smaller than IBM's 3178). And its keyboard is only 16 inches wide (17.9% smaller than the 3178).

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gines/turbines; compressors/blowers/fans; mechanical components; fasteners; fluid system components; metallic materials; nonmetallic materials; plastics/resins/elastomers/rubbers; adhesives/sealants; lubricants; surface treatments; chemicals; and services.

Subscribers can order all 18 files for \$4,500 a year or tailor the subscription to meet their needs. Micro-Index is provided on hard disks or floppy disks at 57% of the Tech-Doc subscription price for use with microcomputers using Microsoft, Inc.'s MS-DOS operating system. Incom is located at 4380 S. Syracuse St., Denver, Colo. 80237.

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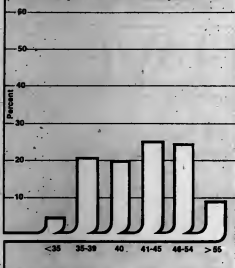
How hard is it to take time off?

Somewhat hard

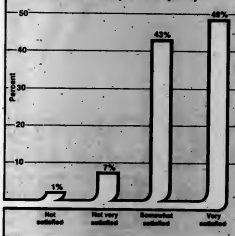
Very hard



How many hours a week do you work?

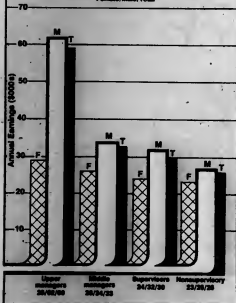


How satisfied are you with your job?

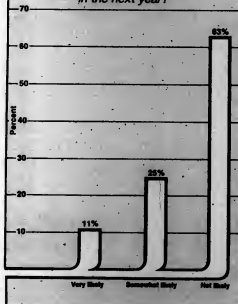


What are your annual earnings?

Female/Male/Total



Will you try to find a new job in the next year?





IN DEPTH

# Software Workers Survey

By Philip Kraft  
and Steven Dubnoff

*Ninety percent of U.S. software specialists express a high level of job satisfaction, yet more than a third of them intend to look for another job within a year.*

*Of the high-tech. fields, software work is the most open to women, yet their status in this area is that of second-class citizens. Furthermore, their situation may get worse before — and if — it gets better.*

There is a frustrating lack of information about the software work force. In an attempt to build a worker profile, we recently conducted a two-year survey of 677 software specialists. We believe this study is the first of its kind based on a comprehensive probability sample. Completed in 1982, it confirmed some widely held beliefs about software work and raised doubts about others.

One of our intentions was to collect the standard demographic and attitudinal data that is available for most other occupations. Data collected by the Bureau of Labor Statistics and the Census Bureau offers a skeletal picture, at best, of the software field. Industry and academic studies of software specialists have been based on convenience samples that are not representative of the general software work force. For example, membership in professional societies is confined almost exclusively to academics and managers. Most software specialists would therefore not appear in a sample drawn from membership lists of those organizations.

By contrast, our study was based on a sample of software specialists of all kinds, drawn from the general population and stratified by age and gender (see box on In Depth/4). It is thus much more representative of the software work force as a whole.

The typical software specialist is male, age 32 (= median, mean = 34, mode = 29), white and employed by someone else. The average programmer has completed 16 years of school. Five percent have only a high-school degree or less, 80% college degrees, 24% master's degrees and 4% Ph.D.s or the equivalent.

Software workers are almost exclusively white. Only 5% are not, and of this group, a majority are Orientals. Women make up 24% of the work force. By contrast, in 1980 the employed U.S. work force as a whole was 11.2% black and 42.4% female.

A majority of respondents said they routinely worked more than 42 hours a week. Although a substantial majority began work at the same time every day, nearly one-fifth said they varied their starting times and 44% said they did not work the same number of hours every day.

Whoever said "IBM isn't the competition, it's the environment" knew what he was talking about. Thirty-five percent of our sample used IBM operating systems — although not all used them on IBM machines. Cobol, assembler and Fortran were the three most widely used languages, in that order, accounting for 53% of the primary languages used. Interestingly, 6.5% of our respondents reported they did no programming at all.

In terms of hardware, it might be said that IBM came in a strong first and Digital Equipment Corp. a weak second.

(Continued on In Depth/5)

## IN DEPTH

## Drawing a Representative Sample

Our sample was drawn from the "street lists" of the cities and towns of the Boston Standard Metropolitan Statistical Area. These lists are a unique resource in that they contain the names, ages, addresses and occupations of all inhabitants over the age of 17. They therefore allow us to construct probability samples of rare occupational groups such as software specialists.

Software specialists were sampled from the lists at varying rates based on age, sex and occupational title.

The goal was to produce a sample with approximately equal numbers of men and women, equally distributed by age.

Women represent about a quarter of the software work force. We oversampled women in order to obtain a statistically valid population of female specialists. The numbers of male and female specialists are proportionately weighted in arriving at the accompanying analysis.

Because each of our respondents was sampled with a known

probability, we have been able to weight our sample to represent accurately the population from which it was drawn. At the same time, we have been able to analyze the characteristics of such rare populations as older female programmers.

Our sampling was inclusive in that we wanted to give every member of our target population a chance to be in the sample. Respondents determined their eligibility based on a series of screening questions which, at their basic, sought to determine whether the potential respondent was employed in a job that "involved the design, production or maintenance of computer software."

We are confident that our sample adequately represents the population of software specialists in the Boston area. We believe it is also broadly representative of the working conditions, if not the industrial distributions, of software specialists elsewhere in the U.S.

The study was supported by the National Institute of Mental Health.

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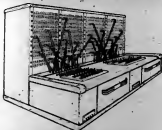
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## IN DEPTH

(Continued from In Depth/3) while everyone else competed for last place. In fact, our miscellaneous catch-all category of "other hardware" came in third, beating all other manufacturers.

In 1981, the mean annual earnings of software specialists exceeded \$31,000. The figure is a bit misleading, however, because managers as a group earn considerably more than nonmanagers. When managers and supervisors are excluded, the average annual earnings figure is a more modest \$26,300.

Upper-level managers do very well indeed. The mean annual job earnings of upper-level managers are \$67,000. For middle managers, the figure is \$34,000 and for low-level supervisors, \$32,000.

#### Job Satisfaction

On the surface, job satisfaction is high. Ninety-two percent of our respondents said they were either somewhat or very satisfied with their jobs. There was no overall difference in job satisfaction between men and women.

Among men, but not women, there is a small and statistically weak association between job satisfaction and satisfaction with pay. In fact, what is significant is the lack of a strong association between pay and job satisfaction. This finding is consistent with studies of other occupations, which show that the nature of the job and on-the-job personal relations are more important than pay in predicting overall job satisfaction.

Although the 92% satisfac-

tion level appears high, American workers in virtually all occupations consistently report high levels of job satisfaction. An earlier study conducted by the University of Michigan showed that job satisfaction for the U.S. work force as a whole was about

the same as that of the programmers in our sample.

A better indicator of job satisfaction is whether employees intend to change jobs in the near future. Thirty-six percent of the software specialists in our sample said they were somewhat or very

likely to look for another job in the next year. Most of those who said they were expecting to look for another job indicated they would look for a different job in the same field, indicating dissatisfaction more with their current job than with the

software field in general.

Another related indicator of job satisfaction is whether someone is willing to recommend the same kind of job to a close friend. Overall, 79% of our sample said they would recommend their job to a friend, while 21%



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# SOFTWARE WORKERS SURVEY

In Depth/6

## IN DEPTH

said they would advise against it or had doubts about doing so. Although somewhat less positive than the response to the question "How satisfied are you with your job?," these figures still indicate a relatively high level of job satisfaction.

The responses changed significantly when we asked our respondents whether they found their managers technically capable and helpful with respect to personal problems that affected the respondents' work. Of those who said their managers

were technically capable, 90% said they would advise a friend to take a similar job. Seventy-four percent of those who felt their managers were not technically capable would recommend their job to a good friend.

Similarly, 91% of those

specialists who felt their managers were helpful with personal problems that affected their work would recommend their job to a good friend. For specialists whose managers were not helpful with personal problems, 68% would recommend their job.

In short, pay seems relatively unimportant in predicting job satisfaction, at least when we ask the straightforward question, "How satisfied are you with your job?" However, if we use the job-recommendation question as an indicator of job satisfaction, competent and supportive managers emerge as statistically reliable predictors of job satisfaction. In other words, managers who have the respect and trust of their staff are more important than money to programmer job satisfaction.

### Equal Opportunity.

The extremely low number of American blacks in software jobs is astounding. We have no systematic explanation for this situation and intend to explore the matter in future studies. For whatever reason, the employment opportunities offered by this prototypical high-tech industry seem to have completely bypassed black Americans.

The situation of women is more complex. Our study confirms a widely held perception that women have established a significant presence in software work: 24% of the software work force is female. To put this figure in perspective, consider that the percentage of women in electrical engineering has recently doubled — to 2%. In addition, women software specialists are represented among managerial ranks in proportion to their overall numbers: 22% of the women in our sample were managers of one kind or another.

Software jobs promise to remain open to women. About equal numbers of women and men entered the field in the two years immediately preceding our study, 1980-1981. Furthermore, in terms of people currently in the occupation, a higher proportion of women than men entered the occupation during the previous five years.

In fact, software work is the most open to women of the technical-scientific fields. One has to look to the traditional social female professions — teaching, library work, counseling, nursing and so on — before finding any professional occupation with as high a percentage of women.

In 1981, the mean earnings of women software specialists were 70% of men's. Even when we control for background characteristics other than gender (years in

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**In terms of earnings, women are better off in large organizations. Pay discrepancies are greatest in small organizations (less than 100 employees), where women earn barely half of what men earn.**

software work, weeks and hours worked and years of education), the figure rises only to 85%.

In terms of earnings, women are better off in large organizations. Pay discrepancies are greatest in small organizations (less than 100 employees), where women earn barely half of what men earn. Pay discrepancies are smallest in large organizations (more than 499 employees), where women earn 79% of male wages (percentages not controlled for background characteristics here).

There are several possible explanations for the variation. The most likely is that federal and state equal opportunity and antidiscrimination regulations apply primarily to large organizations.

These discrepancies are smaller than the male/female wage difference in the U.S. work force as a whole, in which women earn 59 cents for every dollar earned by men.

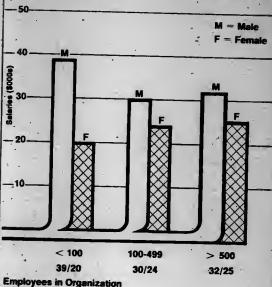
But the earnings gap between men and women software specialists hardly suggests a field free of pay discrimination. To put a dollar value on pay discrimination, on average it is a \$5,000 per year liability to be a woman in software.

In a similar vein, men are three times more likely to be upper-level managers than women (10% vs. 3%). And probably just as significant, women who supervise software specialists are likely to supervise other women, while men are likely to supervise other men. Men managing men and women managing women is a familiar scene in the business world.

The status of managers reflects the status of the people they manage. Our society defines women as low status workers. We would, therefore, expect that women would be managed by other women.

Finally, although few women in

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# SOFTWARE WORKERS SURVEY

In Depth/8

## IN DEPTH

our sample reported that they had experienced job or pay discrimination on the basis of sex, 35% of the women (vs. 19% of the men) said they expected to encounter sex discrimination in the future. Discrimination on the basis of age was also a concern to a minority of both men and women.

We take these anxieties to be an indicator of the type of experiences women software workers have had after working at least a year in the field.

The extent and depth of the pay

***Ironically, in a field that symbolizes the glamour and earnings potential of specialized high-tech skills, the key to financial success in software is not to specialize and not to get too technical. People with the highest paying software jobs spent only modest amounts of their time on technical matters.***

differences — particularly at the management level — are much greater than indicated here. They will be examined in more detail later.

We were especially interested in the relationship between time spent on particular job tasks and total job earnings. Here, too, there were some

contradictory findings. Ironically, in a field that symbolizes the glamour and earnings potential of specialized high-tech skills, the key to financial success in software is not to specialize and not to get too technical. People with the highest paying software jobs spent only modest amounts of their time on technical matters, such as designing specifications for software systems. Similarly, they spent some but not a lot of their time supervising others.

The best paid people spent most of their time making general decisions involving software and hardware purchases, planning the direction of their department or organization and carrying out other — and largely traditional — managerial roles.

In short, in spite of the talk about the financial rewards available to scarce technical specialists, in software work, as in the rest of the corporate world, the rewards go to managers, not to technicians, engineers or scientists. With respect to gender, if generalists are rewarded with higher pay than technical specialists, then the generalists tend to be men while the specialists tend to be women. In programming, we have not found any evidence of a strong relationship between technical skill and high pay.

### Women, Pay and Middle Managers

In terms of demographic characteristics, education and pay, software workers resemble specialists in other technical and engineering fields.

Yet our study also reveals important changes in the organization of software work. These changes promise to have a great effect on entry into the field, the role of women and long-term career prospects, particularly for middle managers.

**Polarization.** The first of these changes is the clear-cut polarization of software work into distinct specializations. By this term we mean more than the traditional divisions by industry or field, that is, business programming or systems analysis. We also find emerging divisions between analytic work and routine work, between work that involves section-making responsibility and work in which most decisions are made by someone else.

We asked our 677 respondents to tell us how much time they spent on a variety of job tasks typically performed by software specialists. The tasks ranged from documenting one's own code to specifying the requirements of a software system to planning the direction of the respondent's department or organization.

When we clustered the tasks performed by the respondents, we discovered divisions that are essentially between managers and managers. Software is now characterized by a thoroughly conventional organizational structure in which some people do the thinking and other people do the work.

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THE NATURAL SELECTION

# SOFTWARE WORKERS SURVEY

In Depth/10

## IN DEPTH

software product were all undertaken by the same small, closely integrated group of specialists — is rapidly disappearing. In its place is emerging a system organized much like a traditional assembly line: Individual workers are assigned

small pieces of a larger task, which in turn is part of still larger tasks. Even the name of the occupation has been changed to reflect this transition: We talk less of "programming" and more of "software production." Our findings confirm

what industry observers have long noted: Documentation, report writing, coding (particularly in Cobol) and maintenance are now distinct jobs, not merely specializations. Comparatively speaking, they are not particularly well-paid. Similarly,

systems design, departmental planning and so on are also now distinct jobs. In contrast to the first group, they are paid relatively well. The elaborate division of labor emerging in software work is sometimes — and mistakenly — called special-

ization. It is more accurately called fragmentation. Increasingly, software work is characterized by a stratification of responsibility and pay, not just a division of labor. What is unclear is whether there is a direct career path between low-paying and high-paying positions.

The software field is still too new to have developed rigid or even clear-cut career paths. Some clues to possible paths can be found, however.

**The elaborate division of labor emerging in software work is sometimes — and mistakenly — called specialization. It is more accurately called fragmentation.**

er, in the history of older engineering and technical fields. Early engineering resembled programming to the extent that it began as a master-apprentice occupation. Training was informal and acquired on the job. Eventually, the engineering fraternity, under pressure from industry, adopted elaborate formal training requirements. It also developed into an increasingly fragmented occupation that replaced the plain "engineer" with "technicians," "designers," "managers" and "entrepreneurs."

Most studies of modern engineering agree that these specializations are distinct careers that do not overlap. To put it in management terms, there is no single engineering career ladder but several. They are not "parallel" and, by and large, they do not overlap.

In the software field following the example of engineering? It is probably too early to say for sure, but many of the signs indicate that it is. Although we have not yet completed analysis of our data on training and education, we have done a quick preliminary examination. The data shows a three-tiered software training establishment that roughly corresponds to the technical school/college/university division characteristic of engineering training. Although we believe that, at present, career opportunities in software are not rigidly associated with formal credentials, we do think a trend in that direction is likely.

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## IN DEPTH

**Women.** A major development in software is the changing role of women. As we described earlier, software work is relatively open to women, particularly in comparison to other technical and engineering fields. On the other hand, our data shows conclusively that women are concentrated in the lowest paid jobs: business programming, documentation and maintenance. They are also concentrated in the worst-paying industries: financial/real estate and communications.

Furthermore, women are paid less in every specialization, in every industry and at every organizational level.

In fact, there is not a single industry in which women achieve pay parity with men. Ironically, the only industry in which women come close to pay parity is financial/real estate, the second-worst paying industry. Only at the bottom of the pay ladder, it seems, are women equal.

At the management level, the pay disparity is even more dramatic. Women supervisory workers earn less than their male counterparts at all levels of management. In fact, the higher a woman goes through the management ranks, the greater the discrepancy between her pay and the pay of her male colleagues: The higher up she goes, the lower her relative income. To state the situation in the baldest terms, on average, the lowest-paid male manager makes more than the highest-paid female manager.

Software has enjoyed a reputation as a field relatively free of discrimination and in particular as a field open to women. Yet the systematic pay discrepancies make a strong case that the field is not characterized by just random pay discrepancies but by systematic pay discrimination against women.

In light of the remarkable pay differences, the entry of large numbers of women into the software field takes on another and perhaps sinister

**The only industry in which women come close to pay parity with men is financial/real estate, the second-worst paying industry. Only at the bottom of the pay ladder, it seems, are women equal.**

meaning. If the field has indeed polarized into relatively creative, relatively well-paid jobs on the one hand and relatively routine, relatively poorly paid jobs on the other, then

women seem to have been recruited to fill the openings at the bottom. Even when they achieve top management positions (or even more rarely, when they enter esoteric sci-

entific and technical specialties), their pay is considerably lower than men's.

It is useful at this point to compare male/female pay discrepancies in the rest of the work force, particularly at the management level. What we find in the U.S. work force as a whole are roughly the same male/female pay discrepancies that we have found in software work. Similarly, women managers in the U.S. work force experience the same degree of pay discrimination characteristic of software. In effect, software work isn't

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# SOFTWARE WORKERS SURVEY

In Depth/12

## IN DEPTH

that different after all.

There are at least two ways to view male/female pay discrepancies in software. Women in software work are, on the whole, no more discriminated against than in other occupations. Indeed, they do somewhat better. Even if women are paid less than men on the average, there are considerably more women in software than in most other engineering occupations: 24% vs. perhaps 2%. Furthermore, their pay, relative to other women, is high.

This figure may actually explain why there are no major statistical differences in male and female job satisfaction. Men compare their pay with that of other software specialists. Women, on the other hand, probably

**Low-level supervisors make 18% more than non-supervisory workers. Upper-level managers make a whopping 82% more than middle managers. Middle managers, on the other hand, make only 8% more than low-level supervisors.**

Upper-level managers make a whopping 82% more than middle managers. Middle managers, on the other hand, make only 8% more than low-level supervisors.

Why are middle managers paid so little? In this case, the simplest explanation is that the market pays middle managers what it thinks they are worth. Many business analysts have

noted that American industry as a whole has been moving away from the traditional pyramid structure of organization — with its many levels of management between top and bottom — toward a form sometimes described as an hourglass.

In other words, organizations are now moving toward a structure with the majority of its employees on the bottom, a very small group of top-level managers and specialists on top and a communications channel connecting the two. The communications channel, of course, performs

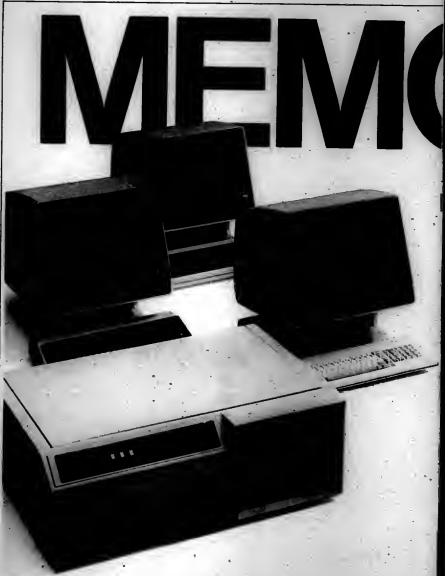
**At least in software work, high tech has not yet fulfilled its potential to be not only new but "different" with respect to equal opportunities for women and minorities.**

compare their (relatively high) pay with that of other women.

The second view is less optimistic. Software work is barely 40 years old. It does not carry the burden of a tradition of discrimination against women. Indeed, modern computer programming began as an all-female occupation. In 1943 through 1944, responsibility for programming the Eniac belonged to a group of young women just out of college. Similar, if less dramatic, roles were played by women on the Mark projects at Harvard University and in the development of some of the first high-level languages, such as Cobol. Yet women in software today still face about the same kinds of structural discrimination as they do in the rest of the work force.

Recall, too, that black Americans have been all but excluded from the job opportunities promised by software work. Women, although relatively better off, are still confined to the least responsible, most routine, worst-paying (and probably dead-end) jobs. For whatever reason, software work has replicated the sexual (and racial) divisions that characterize older occupations. At least in software work, high tech has not yet fulfilled its potential to be not only new but "different" with respect to equal opportunities for women and minorities.

**The Future of Middle Managers.** The third and perhaps most significant change in software work is the position of middle managers. As sharp as the male/female pay differences are, the differences in management pay are even more striking. For example, overall, managers make about 20% more than nonsupervisory personnel. Low-level supervisors make 18% more than nonsupervisory workers.



## IN DEPTH

the functions that were previously the responsibility of middle managers. Because there are relatively fewer positions in the middle but more people than ever competing for them, employers today do not have to pay a very high premium for middle managers.

We suggested earlier that software is probably more like than unlike traditional industries. If this is the case, then the relatively low value the market places on the services of middle-level software managers is entirely consistent with the broader

***The relatively low value the market places on the services of middle-level software managers is entirely consistent with the broader trends in U.S. industry as a whole. Middle-level managers are caught in a squeeze. Like their counterparts in other fields, they are on the verge of being replaced by a machine.***

trends in U.S. industry as a whole. Middle-level software managers are caught in a squeeze. Like middle

managers elsewhere, they are on the verge of being replaced by a machine. The irony is that the machine

that threatens to replace them is one many of them have helped build.

## In Conclusion

It is assumed that software workers are well-paid and generally satisfied with their jobs. By and large, both of these perceptions are correct. Similarly, it is widely believed that the field is much more open to women than other technical occupations. This belief, too, seems based in fact.

On the other hand, our data suggests a different and less encouraging aspect of software work. If women are welcomed in the industry, they are paid considerably less than men. Although male and female entrants are initially paid about the same, the earnings of women flatten out quickly. The earnings of men, on the other hand, seem to increase in a regular way. The pay differences between male and female managers, in particular, are dramatic. An equally large gap in earnings characterized employees of small organizations.

The pay situation of women is reflected in perceptions of discrimination. Women are more likely than men to say they have been discriminated against. Interestingly, a significant minority of both men and women complained about age discrimination.

If the situation of women is not as rosy as the popular image suggests, the situation for black Americans is probably worse. We say "probably" because there are so few blacks in our (or anyone else's) sample. For whatever reason, software work is not the place for black Americans to find jobs.

Another popular conception is that software work is a wide open field. It rewards people on the basis of what they can do rather than who they are. Here, too, preliminary analysis of our respondents' training suggests a different picture. By a large majority, software specialists are college graduates. Most have some formal technical training. Moreover, the younger specialists are, depending on one's perspective, either better educated or more narrowly trained than their elders. Whatever the consequences for the quality and quantity of software, the emergence of de facto credentials in the form of college degrees suggests that the software field has begun to mature. In plain language, "maturity" means that the most important thing about software is not how different it is from other kinds of work, but how similar.

## About the Authors

Philip Kraft, principal investigator, is associate professor of sociology at the State University of New York at Binghamton. He is the author of *Programmers and Managers: The Routinization of Computer Programming* (Springer-Verlag, New York) and numerous articles on the computer industry.

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## IN DEPTH

# Can the People's Republic Catch Up?

*An American finds the Chinese decades behind and asking the wrong questions.*

By Vaughn J. Mantor

*Dai ye* in Mandarin means "waiting for work." The Chinese use the phrase to describe 17-year-old graduates who have not yet been assigned jobs. Chinese programmers also wait. They wait for the rest of the Chinese computer industry to tell them what to do. They will continue to wait.

Early last August, 27 software specialists from the U.S. embarked for the People's Republic of China. We stayed one month and visited six cities along the eastern coast. All of us were, in one way or another, anxious to speak with the Chinese about computer software.

We found an underdeveloped software industry which we would estimate at from 10 to 20 years behind the U.S. We also found a naïveté about software that reminded us of our own misunderstanding of the nature of software 10 or 20 years ago. For example, in Beijing on the first day of our tour, one man asked, "We have the IMS data base at the Census Bureau, but we have heard of System R, a relational data base. Which one is better? Which one should we use?"

Even if we could have spoken without an interpreter, it would have been difficult to explain how dozens of factors



# CAN CHINA CATCH UP?

In Depth/16

## IN DEPTH

affect the choice of a data base management system (DBMS) and how it would be unprofessional to recommend one over another categorically.

I don't mean to malign the Chinese. They are intelligent, hardworking and genuinely interested in the computer field. They have read much of the academic and theoretical literature. But they are unaware of the vast and difficult engineering that is necessary to build modern software. Their naivete stems from the country's self-imposed isolation of 30 years. Unfortunately, their simplistic notions are not limited to the computer field. While we were there, a petroleum engineer asked a Texas oil man, "What is the best way to drill for oil?"

**Some time before our group arrived, the Chinese made a list of topics in which they were especially interested: data bases, microcomputers, local-area networks and on-line transaction processing and data base applications.**

Some time before our group arrived, the Chinese made a list of topics in which they were especially interested: data bases, microcomputers, local-area networks and on-line

transaction processing and data base applications. Most of our delegates prepared presentations on these subjects. In each of these areas we found the Chinese knowledgeable about theory but ignorant of how to apply it. It is fair to say that even their theory is not quite current.

The data base is probably the most popular topic in China. But as in other areas, the Chinese ideas of data bases are similar to our ideas a few years ago. The story about Zhangzhi is one example. There are others. At a university near Guangzhou, a master's degree student is doing his thesis work building a data base manager that has the functions and organization of Cincom Systems, Inc.'s Total. Although this student is familiar with the work of Edgar F. Codd and others on relational data bases, his knowledge (and the knowledge of most graduate students) about engineering a data base

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**The largest project ever done by the Shanghai Technical Services Corp. — the only one I know of in the province — contains 25,000 lines of Fortran.**

management system is lacking.

It's not as if the Chinese have no experience with data bases. The Census Bureau uses IMS, another agency uses Digital Equipment Corp.'s DBMS 10/20 data base, and there are a few installed applications which, at the least, demand some on-line file manipulation and searching. For example, in Shanghai, there is a semi-automated telephone directory assistance system. With it, an inquiry for a number can be answered in three to five seconds.

The problem is the limit of the data base technology that supports the system and the limited incursion of the technology into the society. As far as I know, Shanghai boasts the most sophisticated directory assistance system in China. But the city has fewer than 60,000 telephones to serve its 11 million residents. And the data base is extremely stable because virtually all of the telephones are in business, state organizations and hotels for foreigners. Moreover, the directory assistance system is regularly shut down for reorganization and backup, which forces users to call back later.

The Chinese showed their need for data base engineering expertise in other ways as well. In Shanghai, one of the presentations that was particularly well received addressed the performance evaluation of data bases. By the audience's questions, we concluded:

1. The Chinese are just beginning to consider the question of data base performance.

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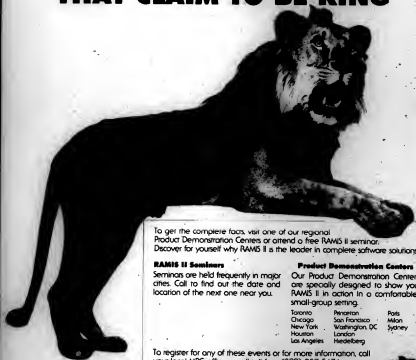
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2. They did not realize how difficult it is to measure performance.

3. They had not yet considered the difficulty of separating the measure of the data base's performance from the measure of its performance in a particular environment.

4. They were not familiar with the standard benchmarks of the commercial data bases.

Although the Chinese are enthralled with data bases, they realize that well-designed data base management systems are only academic exercises unless applied to problems. Understandably, they were not as enthusiastic about this more mundane topic. For the Chinese, building applications with data bases is quite possibly a bigger problem than building the DBMS.

There are several reasons for this apparent contradiction. First, using a data base to support management information systems is not usually economically feasible unless there is a relatively large body of data to manage. That requires substantial disk storage, and disk storage is prohibitively expensive and very difficult to come by in China. Data bases in management information systems usually mean large numbers of transactions, and to process them takes computing power — power the Chinese rarely have.

Most data bases are supported by ancillary and complementary systems such as a teleprocessing monitor for inquiry and update. Much of this support is unavailable to all but a few installations in the country.

Besides the difficulty of obtaining support, the Chinese have little experience in developing systems large enough to warrant data bases. The largest project ever done by the Shanghai Technical Services Corp. — the only one I know of in the province — contains 25,000 lines of Fortran. The only commercial transaction processing system built in Tianjin, the third largest city, is a limited batch banking system.

In the building of applications systems, the Chinese appear to be farther behind than in most other areas. While we are looking at prototyping and generation as ways to automate the development of transaction processing systems, the Chinese are struggling to handcraft them.

Large-scale systems also demand more attention to the management and control of the development project and the accuracy, succinctness and organization of system specifications. During our entire trip from Beijing to Guangzhou, I found no evidence the Chinese are aware of the methods currently in use in the U.S. such as Warnier-Orr or Yourdon for management or specification.

Microcomputers are also of great interest to the Chinese. Just after we returned, the Committee for Science & Technology decided that the hardware industry would concentrate on the development of micros as opposed to minis or large computers. Because the economy is centrally

**The Committee for Science & Technology has decided that the hardware industry will concentrate on the development of micros as opposed to minis or large computers. The micro segment of the industry will be given the resources to expand and develop new products at the expense of the other two sectors.**

planned and administered, this pronouncement means the micro segment of the industry will be given the resources to expand and develop

new products at the expense of the other two segments. The Chinese will diminish or discontinue research and development on large

machines and their ancillary hardware and software systems.

Although I disagree with the principles of a centrally planned economy, I do not know if it is a mistake for the Chinese to concentrate on microcomputers. I do know that if China tries to catch the micro technology of the West, the effort will be like trying to hit a rapidly accelerating target. In Shanghai, we were told the Chinese are able to build only 4K chips, and the yield from the manufacturing process was only 30%. But they said they were researching 16K

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## IN DEPTH

chips and 16-bit architecture. Compare these ventures with IBM's announcement of the 512K chip or Hewlett-Packard Co.'s 32-bit micro.

Moreover, the price of Chinese microcomputers is very high, beginning at about \$14,000. Even though the labor is inexpensive — 10 cents to 17 cents an hour — the cost of parts is exorbitant, availability is low and service is intermittent at best.

Chinese-made micros are based on the Intel Corp. 8080 but do not contain an 8080. They have a wired-board equivalent. The error rate in wiring the board contributes to the high cost and low reliability. Even if the Chinese add huge import duties to the cost of foreign-made microcomputers, they will probably be able to import them more cheaply than build them for the next 20 years or more.

The fourth area in which the Chinese are most interested is local-area networks. Here, too, the West's lead is large. I do not believe there are any local networks in regular use in China outside research installations. The gap between the Chinese ability and the West's is so big, they are incredulous at some of our advances. During a presentation about Omninet, one of our delegates from Corvus Systems, Inc. was interrupted by one of the Chinese who said, "That's not possible." The speaker was describing an installed feature of Omninet.

## The Country's Needs

Before one can grasp the predicament of the Chinese computer industry, one must try to understand the relationship between the computer and Chinese society. In China, labor is inexpensive; materials and machinery are expensive. Information and knowledge are dear and to be hoarded, but time (in a society with a recorded history longer than 5,000 years) is less important than it is to Westerners.

In the West, where labor is expensive, we have used the computer as a labor-saving device. But in China, using a \$5,000 computer instead of 10-cent-an-hour labor means the computer cannot possibly pay for itself in less than 15 or 20 years. Moreover, Chinese managers rarely have the authority to fire employees, so the computer may not save any labor costs at all. Many of the possible users in China are not interested in computers for this reason: labor is cheap and computers are expensive.

Cheap labor is not the only barrier to greater use of computers in China. We take for granted the phone system, the ready availability of replacement parts, supplies and service and at least some standardization among the models built by any particular computer manufacturer. The buyer of a Chinese computer cannot, as a matter of course, find these supports. Although many Chinese don't see the need for computers — and in spite of the great obstacles to installing them — China's leaders eagerly want them. They understand the

*Even if the Chinese add huge import duties to the cost of foreign-made microcomputers, they will probably be able to import them more cheaply than build them for the next 20 years or more.*

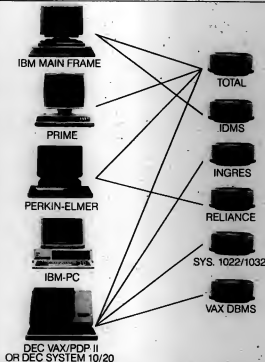
country's computer needs, and the needs are urgent. China has more than one billion people, mostly farmers, and grows by 17 million more every year. It may be possible (al-

though unlikely) to run an agrarian, regulated, controlled, centrally planned society of a billion souls without computers, but a modern society based on industry, information

and services is impossible without them.

And China's leaders are anxious for their country to become a modern society.

In its anxiety to be modern, China has begun a program called the Four Modernizations. This scheme is supposed to transform China into a "powerful socialist economy" by the year 2000. The four sectors of the society selected for rapid modernization are agriculture, industry, defense and science and technology. Many of China's computer



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specialists claim the government ranks computing among the most important technologies. However, the plans seem too ambitious to be finished by the turn of the century, and the computer sector appears to be a little behind schedule.

China may even be too far behind to soon build its own international computer industry; they will probably import computer technology for many years. The supporting goods and services that are needed for a computer industry do not exist or are difficult and expensive to get. By the

time the Chinese build them, computer technology will have moved ahead again.

Besides lacking management information to run the country, the Chinese lack technical information. The government prohibits or discourages importing much of the West's literature. The U.S. and other countries will not allow export of certain technology and information to China. And much of the literature is just too expensive for the individual Chinese.

With wages of \$60 per month, a

university professor could hardly afford a \$50 subscription to the *Communications of the Association for Computing Machinery*. Even a \$24 subscription to *Time* or *Newsweek* represents two weeks' wages or more for most Chinese. China's economy, politics and technology argue against any significant computer industry in the foreseeable future. And as long as the West prohibits export of advanced computer technology, China will stay in the rear.

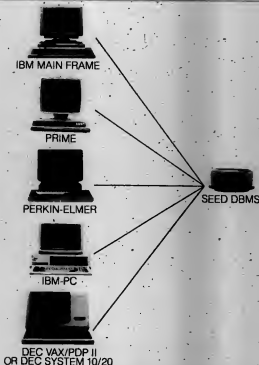
Unfortunately, one of the big problems facing the Chinese com-

puter field is the language. As yet, the Chinese cannot process their own language.

There are probably more than 50,000 characters, or pictographs, in Chinese. However, there are only 400 syllables, so a single sound can represent more than 100 different pictographs. If that were not enough of a difficulty, the tone or pitch of the syllable changes its meaning. There are four tones in Mandarin — level, up, down and up, and down — but nine in Cantonese. Both spoken and written Chinese are so different from languages using alphabets that they inhibit China's computer technology.

A number of researchers in China

**The Chinese lack technical information. The government prohibits or discourages importing much of the West's literature.**



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are searching for ways to manipulate Chinese characters in computers. To date, they have solved only the I/O problem. They have a keying method for input, an arbitrary encoding or numbering scheme and special output software that drives special dot matrix printers and CRTs.

Because so many people are working on the problems, there are several different solutions to I/O.

None are particularly elegant or efficient. The first solution was no more than a typewriter-style keyboard with hundreds or thousands of keys. Another solution is a touch-sensitive, flat, plastic board about 18 in. by 30 in. Various sections of the board are marked in different colors. There is a row and column array within each colored area. Each cell of the array contains one, or occasionally two or three, Chinese characters. The operator enters a character, by touching the character on the board with the wand.

A third solution uses a standard typewriter-like keyboard with an alternate function key. Holding the alternate function key, the operator can draw the "strokes" of a character by pressing various English letter keys. It can take up to eight strokes to define a Chinese character, and even then there may be some ambiguity. None of these methods are very efficient, and they do not allow a programmer to do anything other than read, store and display Chinese characters.

In the simplest storage schemes, each character is stored as an arbitrary, 16-bit number. However, there does not seem to be any available method for processing with the stored characters — no sorts, no merges, no comparisons — because the code does not conveniently correspond with meaning.

The display of Chinese characters

is also a small problem. Although impact printers are impractical, dot matrix and laser-electrostatic printers are very useful. However, dot matrix printers must use a large matrix—about 21 by 27 points—and are not as fast as most other printing methods. Laser-electrostatic printers seem to be the most promising type for the Chinese language. Besides speed and flexibility to print any Chinese character, the laser-electrostatic printer is the only type that can mix Chinese and English characters at higher printing speeds.

**The Chinese language can be displayed on a CRT, but there are problems. If the tube is one that accepts and displays data in fields, such as an IBM 3270, there are not enough points in a cell's matrix for printing Chinese characters.**

Chinese can also be displayed on a CRT, but again, there are problems. If the tube is one that accepts and displays data in fields, such as an IBM 3270, there are not enough points in

a cell's matrix for printing Chinese characters. So the choices are to expand the size of every cell or to use more than one cell to display a character. No matter what the choice, the

result appears to be the same: A lot less information will fit on a screen.

#### Best Solution

Raster graphics terminals would seem to offer the best solution to the problems of display, but this type of terminal does not fit well into day-to-day operations' information systems. These systems have substantial numbers of data transactions. Raster graphics terminals are not designed for that use. Besides, Chinese graphics equipment and software are far behind the West's. The only Chinese-made graphics terminal I saw was an experimental vector machine of limited ability; all the other graphics equipment was Japanese and American.

Beyond all these problems looms the English language. Virtually every manual, technical report and significant paper on computing is printed in English. Even if the original was not, the second printing probably will be. There is a shortage of technicians in China because they must speak two or more languages. To alleviate the problem, China has assigned a large number of translators, who are ignorant in computer technology, to translate technical papers into Chinese. The problems with this approach are obvious.

The greatest setback for China's computer industry, indeed for all of China, was the Cultural Revolution. Between 1966 and 1976, while the West built a computer industry, the Chinese dismantled their high-tech industries.

While the U.S. reaped a crop of the best scientifically educated people in history, the Chinese closed many of their universities, eliminated graduate schools and persecuted professors and other intellectuals, sending them to the farmlands to be reeducated.

It was not until 1978 or 1979 that China reopened a graduate school. While the countries of the West enjoyed a relative internal peace, demonstrations notwithstanding, 20 million youths in the Red Guard ran rampant throughout China. Provided with free food, clothing and transportation by the government, they destroyed much of China's science, technology, literature, art and artifacts.

Today there is a lack of hardware and software experts that makes our shortage look like a surplus. It is another reason the Chinese are unlikely to have a substantial computer industry any time soon.

#### About the Author

Vaughn Jeffrey Mander is a consultant and researcher with Computer Task Group (CTG), a nationwide software services company headquartered in Buffalo, N.Y.

Currently he is developing a large transportation application system, designing a graphics productivity aid for system development and teaching at CTG's Institute for Technical and Management Training.

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# China's Goal to Build Own Computer Industry

By Chen Liwei

*This article was originally prepared by China Computerworld and appears here courtesy of the CW International News Network. The author is chief engineer at the Administration of Computer Industry under the Ministry of Electronics Industry.*

At the first national meeting called by the Computer and LSI Leading Group in May, Group Leader and Vice-Premier Wan Li pointed out, "If we are to quadruple the gross output value and realize the four modernizations, we must first of all build up our own computer and LSI industry." As a professional in the computer field, I feel it is our responsibility to realize this goal. But how?

The computer industry has developed at an astonishing speed in advanced countries. In the U.S., the gross national product (GNP) quadrupled between 1958 and 1978, but the value of computer hardware output rose by 40 times (50 times, if software and services are included). In 1958, the computer hardware output value in the U.S. was only 1% of the



GNP, equivalent to the present situation in China. But 20 years later, its output value represented 1% of the GNP, a growth rate 10 times higher than the GNP. If compared with the U.S. electronics industry, the com-

puter hardware annual output value jumped from 7% to 50% of the total output value in the same two decades, a growth rate seven times faster than that of the electronics industry.

In the other economically developed countries, the annual growth rate in computer industry output value averages more than 20%. Then what about China's?

At present, China has more than 300,000 industrial enterprises, a vast potential market. As the reform of management systems develops in depth, the demand for computers will inevitably become greater and greater. By 1990, several thousand backbone industrial enterprises will have installed mainframes and minicomputers. By the end of the century, this figure will rise to several dozen thousand.

If one considers the need for computers in finance, trade, commerce and administration, the number of installed mainframes and minicomputers may reach several hundred thousand. And applications of various types of microcomputers will involve huge quantities of those devices, too.

Therefore, as in other developed countries, China's computer industry will grow dozens of times in 20 years, at a speed much higher than

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working, computers could not have played miracles.

There are about half a million software workers in the U.S. About 80% of them work in user companies. This figure is much greater than the total staff and workers of IBM. In the Soviet Union, there are about 200,000 application software people working at the All-Soviet Automatic Management System (ACY). But there are only 40,000 technicians for software and hardware development of the EC series computers that serve the ACY.

These figures show that application software people are much more than product development technicians (software and hardware people together). If these people are not trained on a regular, timely basis, computer applications become merely empty talk.

To explain how many application software people China needs, I give the following example. If 5,000 information systems were to be put into use by the end of the century and each system had 40 software people, the whole country would need 200,000.

Though China has a very limited number of application software personnel for the time being, it has very rich human resources.

Model	Word Size (in Bits)	Memory Size	Speed (Operations per Second)	Factory
DJS-101	16	8K to 32K bytes	400,000	Huadong Teachers' University Scientific Instrument Factory
DJS-110	16	4K to 12K bytes	90,000	Chongzhou Radio Factory No. 2
DJS-112	16	4K to 32K MOS	150,000	Shaoqun Radio Factory
DJS-130	16	32K bytes	500,000	Suzhou Computer Factory Weifang Computer Factory
DJS-131	16	32K bytes	500,000	Beijing Computer Factory No. 3 And two others in Tianjin
DJS-132	(Upgraded DJS-131)			Shanghai Computer Factory
DJS-136	(Same as DJS-130, temperature resistant -15°C to 45°C)			Tianjin Radio Technology Institute Tianjin Electric Instrument Factory Suzhou Computer Factory
DJS-140	16	64K to 128K	800,000	Tianjin Radio Factory No. 2 Yunnan Electric Equipment Factory
DJS-142	16	54M bytes		Beijing Computer Factory No. 3 Jinzhou Computer Factory
DJS-153	16	32K to 128K MOS	1-1.4 million	Jinzhou Radio Technology Institute No. 785 Factory
DJS-154	16	32K bytes	200,000	Suzhou and Weifang Computer Factories
DJS-163	16	28K bytes	500,000	No. 738 Factory, Dalian Radio Factory
DJS-164	16	32K to 128K	400,000-500,000	No. 830 Factory, Hubei Radio Factory
DJS-185	16	32K to 124K	500,000	No. 1915 Institute
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Minicomputer Models Manufactured by Chinese Factories

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The shortage of application software people could be solved by teaching computer applications in colleges and training staff technicians in a planned way.

From a long-term point of view, the computer industry will take over more and more of the development of large-scale application software now done mostly by the users themselves. As a result, the software industry will gradually take shape; and the users' second development will gradually decrease.

The computer will eventually appear to users as an almost wholly "complex" product.

In China, some end users have

worked to develop application software. They should be encouraged. However, as there is not yet a way to evaluate software and no copyright law to protect it, their work has not been rewarded properly and their initiative is dampened. The state must work out a law to protect software products and find a way for software evaluation. Otherwise, the software industry can never be developed.

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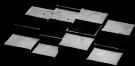
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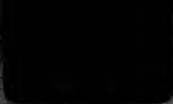
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## IN DEPTH

and cannot be repaired within minutes, routine work has to stop and the user suffers heavy losses. Every one of us in the computer field must have a clear understanding of such consequences. Our products should have good quality, reasonable price and backup services. "Reputation" means making users completely satisfied.

Building up reputation is easier said than done. Though some computer factories in China have begun to do so, homemade [domestic] computers in general are not of high rep-

**The state has worked out some policies to restrict importation and protect domestic industries. But these policies need improvement. The state should also formulate a plan concerning the development of technologies so that the computer industry can grow according to social needs.**

utation. At present, especially when some computer products have lost their reputation in one way or an-

other, doing one or two good things can by no means redeem one's reputation. Only by doing thousands of

good things in a period of several years can a factory redeem and build up its own reputation.

Therefore, the computer industry should put a high priority on building up its reputation and should treat that reputation as a lifeline. Without it, there will be no computer industry for China.

As an integral part of the national economy, China's computer industry must develop proportionately, in a planned way. But what is meant by "in a planned way"?

Usually it takes three to four years to develop a medium-size system or minicomputer. While the product is being prepared, production lines must be set up and industrial production capacities determined. Personnel must be trained to work at maintenance services centers to be built throughout the country. This process requires a huge investment. The cost to put a new model into production might reach tens of millions of dollars, or five to seven times more than the development expenses.

After a new model is put into production, it should be manufactured for a certain period (say five years) and sold in certain numbers (say 1,000 sets). Otherwise, the investment will not be able to return profits. After that certain period, the system should be replaced by another more advanced model. This is what "in a planned way" means.

Such ideas actually are quite common knowledge. But in reality, they are not so easy to be carried out. For instance, we are developing and trial-producing a new computer model equivalent to the international level of the late 1970s and early 1980s. In three or four years, it will be put into production. But computer technology advances very rapidly in the world. By the time the new model is ready for volume production, some more advanced foreign-made models with better cost/performance will have already entered the Chinese market. They will inevitably have a strong impact on the domestic model. The very existence of the computer factory will be threatened and the production plan seriously affected.

This situation is not a hypothesis. As a matter of fact, some Chinese factories that have undertaken to develop new models are sitting under the sword of Damocles. How can they have the resolve and courage to put in more financial and human resources for mass production and backup services? Such a new model might well come to a premature end. Even if it did go into operation, it may not be manufactured on a mass scale. The price might be too high, quality too low and maintenance services unprepared. What a worrying picture this is!

However, we should not be that pessimistic. True, China's computer industry is still young and lacks competitive ability. The state has worked out some policies to restrict importation and protect domestic industries. But these policies need further improvement.

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# AN **SNA** PRIMER FOR PROGRAMMERS *Part 1*

By David M. Baer and Jim Sturch

The programmer/analyst and the communications specialist often speak different languages. After all, to the typical programmer, "able baker" could easily designate an individual capable of producing a credible croissant, while asking a person involved with communications to "scratch a data set" might be interpreted as a request to vandalize telephone company property.

It is not surprising, therefore, that a programmer frequently meets with failure when he attempts to improve his knowledge of the IBM environment by learning something about Systems Network Architecture (SNA). Most written material on the subject originates with people whose primary expertise is communications.

With this basic problem in mind, we offer a "grass-roots" overview of SNA as

an introduction for those who do not speak the language of communications specialists.

This discussion is intended for the programmer who would like a general explanation of how information flows between points in an SNA network, for the potentially serious student who needs a starting point for a more extensive education and for the project manager who would like to be able to look systems programmers straight in the eye, even as they speak of NCPs, NCCFs and NPDAs.

SNA did not burst upon the scene fully developed; the technology's power and flexibility have expanded continually since its introduction in 1974. It is educational to follow that evolution to understand not only what the various SNA hardware and program products

# SNA PRIMER

## IN DEPTH

In Depth/34

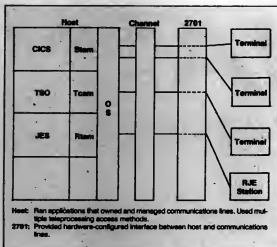


Figure 1. Pre-3705 Networks

are, but also their reasons for being. In the early '60s to early '70s, before the first release of SNA products, a typical environment would have been similar to the one shown

in Figure 1. The host computer, a 360 or later a 370, ran applications that owned communications lines, which were assigned a unique and fixed subchannel. A terminal connected to

TSO, for instance, was owned by TSO and could not access any other application. The lines also used a predetermined protocol that dictated the type of terminal required.

This inflexibility resulted in wasted potential network resources and unnecessarily high communications costs. Finally, no capability existed for host-to-host communications; the structure was strictly limited to a master/slaves relationship.

Within the hosts, applications would accomplish network communications using one of several telecommunications access methods. As Figure 1 illustrates, TSO used Tcam, CICS and IMS generally called upon the services of Bism and JES used a less familiar access method, Bism. None of these access methods were compatible, however. For instance, TSO could not communicate via Bism. Clearly, a universal telecommunications access method was needed to permit flexible network utilization, as well as to provide a standardized foundation upon which to base future telecommunications program products.

Devices in communication with the host had to be connected directly to the channel or could interface to front-end communications controller, the 2701. The 2701 was a nonpro-

grammable, hardware-configured device; hardware modifications were required to change the interface.

### Enter the 3705

A new communications controller, the 3705, was introduced in 1972. While it was later to become one of the cornerstones in the SNA hardware product line, its initial function was to replace the 2701. Though it performed the same network role, it offered more attractive price/performance characteristics and, more significant, it was programmable. This feature allowed it to function as a 2701 look-alike by employing an emulation program; it also allowed network modifications to be introduced far more easily. However, a more important aspect of the 3705 was that it set the stage for the introduction of the first true SNA networks.

In 1975, IBM introduced two major program products and compatible hardware in the 3720 product line that supported an approach to network management dramatically different from the one preceding it. An example of an initial SNA configuration is illustrated in Figure 2.

In the host, a universal telecommunications access method was provided which ran in its own partition. The Virtual Telecommunications Ac-

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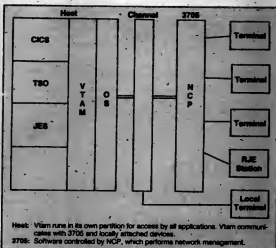
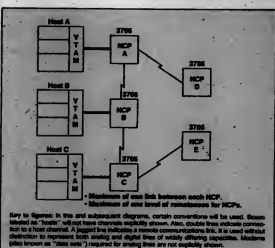


Figure 2. Vtam/NCP Networks

cess Method (Vtam) was available to all application subsystems such as TSO, IMS and CICS to receive and direct network messages to locally attached terminals, 3705s and other ap-

plications within the same host. Vtam provided the additional benefit of being able to supply a level of communications error recovery above that of the application.



Also significant was the fact that Vtam owned all the resources of the network, which permitted a degree of network flexibility previously unachievable; the applications no longer owned the communications lines they used. This meant that a single terminal on a fixed line could now be used to communicate with a variety of applications.

A Vtam-compatible software package was introduced at the same time to run in the 3705. The Network Control Program (NCP) provided additional support for the networking environment. It allowed communications with Vtam using only a single subchannel between the 3705 and

the host. It assumed additional network management responsibilities such as polling, which previously had been accomplished by the host. It also supplied another level of error recovery between the application and the devices in communication with it.

There were problems of stability in the early SNA networks, as might be expected of any new, highly complex technology. There were also limitations: The network was essentially still limited to a master/slaves configuration, and multiple hosts could be integrated into a single network only with great difficulty.

These problems and others were

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## IN DEPTH

alleviated in 1978 with the release of a new set of Vtam/NCP packages extended with the Advanced Communications Function (ACF). These new releases provided improved stability and application interfaces, as well as better operator facilities. ACF/NCP offered the ability to alter device configurations dynamically on the network; it also provided improved testing and error diagnosing/reporting capabilities. ACF/Vtam supplied corresponding support for these features. Furthermore, ACF/Vtam and ACF/NCP supported and were com-

**A major evolutionary event in the history of SNA occurred in 1981 with Release 3 of ACF, a new level of SNA software intended to support expanded network capabilities.**

patible with several new program products that dramatically improved network flexibility and network management capabilities.

The ability to integrate multiple hosts in a single network was provid-

ed with a new feature of Vtam, the Multiple System Network Facility (MSNF). An example of a multihost system is shown in Figure 3. MSNF supplied the capability for any terminal in the network to be in session

with an application in any host. It also supported application-to-application sessions between two separate systems. A related product, Network Job Entry (NJE), provided further capabilities for processing in multihost systems. With it, batch jobs could be transferred from one host to another for execution, and job output could be transferred among hosts for printing or browsing.

A powerful tool to assist operators in network definition and monitoring became available with the Network Communications Control Facility (NCCF). Running as a Vtam application, it provided a program operator interface to Vtam, accepting commands from the NCCF operator and passing them along to Vtam. It permitted the creation of a network master terminal to which Vtam messages from all hosts could be channeled, while collecting those messages in a single log. NCCF also supplied a capability for defining and executing command lists similar to Clists in TSO.

## NPDA Services

With large networks of complicated configurations now possible, a tool to assist in troubleshooting network problems was needed. This capability was made available with the Network Problem Determination Aid (NPDA). It is a Vtam application program that runs as a task of NCCF. NPDA performs a wide range of problem-determination services:

- Recording error statistics on network resources.
- Providing interactive and dynamic display of current networking conditions.
- Maintaining history data bases on network resources.
- Generating alarms as resources approach on overload state based on predefined threshold values.
- Permitting concurrent testing and production usage.
- Determining and reporting on probable cause of failures.

Performance monitoring in general also needed automation, and this ability was provided with the Network Performance Analyzer (NPA). Resources that it could monitor included utilization of lines and 3705 processors and buffers; message rates of lines and logical units; and error rates for lines, physical units and logical units. It further provided threshold reporting on error rates, data rates, queue lengths, 3705 utilization and polling rates.

All of this collected information was maintained in a data base for subsequent reporting and interactive retrieval. Performance analysis functions did not extend to the NCP; however, this feature would come in a later release.

## ACF/Release 3

The next major evolutionary event in the history of SNA occurred in 1981 with Release 3 of ACF, a new level of SNA software to support expanded network capabilities. Extensions to Vtam included the ability to

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specify classes of service and network priorities for network traffic. This was particularly useful in networks incorporating satellite communications channels, with their high capacity but relatively long transmit/receive delays. It was also beneficial where network traffic consisted of both batch and interactive transmissions. NCP extensions further expanded network possibilities.

Transmission groups, which are multiple parallel links between 3705s, replaced single links, and multiple transmission groups were permitted between pairs of 3705s. Remote-to-remote links were allowed; previously only one level of remoteness had been possible. Multiple session routing was supported where a session would select one of several predefined routes based on priority and availability. All of these capabilities contributed to improving throughput and ensuring reliability. Figure 4 illustrates the possibilities of networks at this time; compare it with Figure 3 to get an appreciation for the added capabilities.

#### SNA - Version 2

IBM is known for its ability to do a great many things well, but consistent naming of its products is not necessarily one of them. Version 2 of SNA, released in 1982, does contain several significant enhancements, but it is hardly the revolutionary advance one might expect of it, given

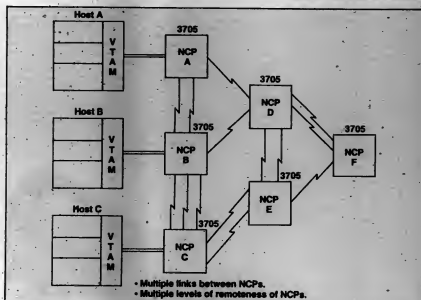


Figure 4. ACF/Release 3 Networks

its weighty designation. This latest release provides productivity aids for network systems programmers, and

Network Performance Analyzer functions are now integrated into the NCP. Multiple system coupling, for-

merly a separately available option, is now a standard feature.

The most dramatic enhancement is the ability to link mainframes with direct channel connections without a communications controller in between. That suggests a number of interesting possibilities such as channel-connected dedicated data base machines.

#### Communications Architecture

Preceding each of the hardware and software products described in the previous section was a substantial body of concepts and specifications directing the design of those products, and that is what SNA really is. It is a set of definitions of protocols and formats under which to implement compatible communications products. SNA is not something tangible like a piece of hardware or a listing of software. The NCP, for instance, is not a part of SNA; it is a software product implementable to standards defined within the architecture.

Furthermore, it is unlikely that any SNA communications component will ever contain all the functions allowed in the architecture. Instead, each product implements only that portion of the architecture it requires to perform its function.

Another important aspect of SNA's scope is that it does not govern the method of implementation of any function; that is, it does not require that a given function be implemented in hardware or software or some predefined combination of the two. It does dictate the structures that a function must use and the protocols it must observe.

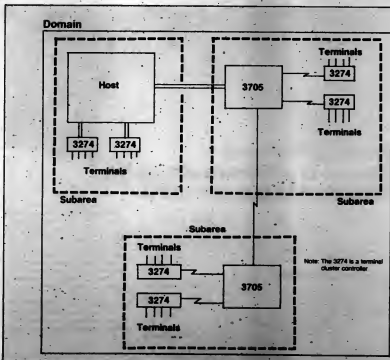


Figure 5. Domains and Subareas

## IN DEPTH

Finally, it needs to be understood that SNA is not a monolithic entity of implemented components which provide services that must be used to accomplish data communications. For example, while CICS uses VTAM as a telecommunications access method, within CICS are some functions duplicating services provided by VTAM. This was done because it was easier to directly implement those functions within CICS, and this in no way violates rules of the architecture.

## Elements of the Architecture

Any data communications network consists of communications lines and all the nodes at which one or more of those communications

bit network address, but it was foreseen that this would eventually be too restrictive. In the current definition of SNA, network addresses have two components: a 32-bit subaddress and a 16-bit element address within the subaddress.

Now, a 48-bit address space permits a network size of awesome proportions, and no network with that many NAUs is likely to be created in the foreseeable future. However, it should be remembered that at one time, a 24-bit memory address space in the early 360 processors was

thought to be more than sufficient. The new 3084 processors with their 31-bit addressability to real memory are presenting IBM with a major task in modifying its system software to accommodate the new memory capacity.

A shorter 8-bit address is used for localized data flow within a subarea. For example, a 3274 cluster controller can have a maximum of 32 terminals attached and clearly has no need to support full network addressing. The process of conversion between network and local addresses will be de-

scribed shortly.

In addition to the SSCP, there are two other major types of NAUs: physical units (PUs) and logical units (LUs). A PU may be thought of as the manager of the physical resources of a node, and each node will usually contain exactly one PU. Most nodes will also contain one or more LUs; these are, effectively, interfaces between the end users and the network. An end user is an application program, a terminal operator or any other user of the network's communications services.

**A 48-bit address space permits a network of awesome proportions. No network with that many NAUs is likely to be created in the near future.**

lines terminate. In SNA networks, those communications lines are of two basic types: local lines connecting a device directly to a host processor's channel and remote lines interconnecting devices with serial data links, which range from slow analog telephone circuits to high-capacity digital satellite links. The nodes that the lines interconnect include such familiar objects as host processors, communications controllers, terminals and RJE devices.

In every SNA network resides at least one central control and coordination facility. This is called the system services control point (SSCP); it resides in a host processor and may be thought of as the "brains" of VTAM. The SSCP is responsible for managing and allocating all network resources under its control. Those resources include not only the hardware components and communications lines, but also application programs known to the SSCP.

Any individual resource is known to the SSCP as having a unique network address, and thus this wide variety of network entities is referred to as network addressable units (NAUs). All NAUs under the control of an SSCP constitute a domain. For the moment, the discussion will be restricted to single-domain (single-host) networks, but the topic of multidomain networks will be explored later.

Within each domain are one or more subareas. A subarea is comprised of a host/SSCP and its locally attached NAUs or a 3705/NCP and its locally attached NAUs. A domain and its subareas are illustrated in Figure 5 (see In Depth/37).

There are basically two types of network addressing used in SNA: networkwide addresses and local addresses, known only within a subarea. Early SNA networks utilized a 16-

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—Bob Frankston, President, Software Arts (Wellesley, Massachusetts)

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It should not be inferred, as the names might suggest, that PUs are hardware implementations and LUs are software implementations. It is also untrue that LUs do not concern themselves with interacting with the physical processes of data transmission. PUs and LUs were defined as a mechanism for the distribution of functions and responsibilities within a node.

Four PU types currently exist in SNA:

**PU Type 5 (PU.T5)** is the physical unit of a host processor and is imple-

mented within Vtam.

**PU.T4** is the physical unit residing in 3270 and is implemented within the NCP. Currently, communications controllers are the only nodes that have only a PU and no LU.

**PU.T2** is a cluster controller like the 3274.

**PU.T1** is defined for pre-SNA 3270 terminals and is provided so that a large base of existing equipment could be incorporated into new SNA networks. While they may play a dominant role in many existing networks, their future architectural

significance is limited and they will be disregarded here.

PUs of one type may communicate with PUs of any other type. Nodes containing a PU.T5 or PU.T4 are designated as major nodes, and PU.T2 nodes are designated as minor nodes. Thus, another way of defining a sub-area could be to say it is a major node with all locally connected minor nodes.

There are six currently defined types of LUs which effectively define the mode of communications between two nodes. In most LU-to-LU

## SNA PRIMER

### IN DEPTH

communications, one of the LUs will have access to more powerful resources and will thus assume greater responsibilities in the management of the communications. The more powerful LU is designated the primary LU (PLU) and the other the secondary LU (SLU). Unlike PUs, LUs may only communicate with other LUs of the same type.

The types of LUs are:

**LU Type 1 (LU.T1)** is used for communications between an application program and a remote SNA printer or workstation using what is known as SNA character strings (SCS), which contain data and formatting commands. SCS have more flexible and appropriate commands for printer control than a 3270 data stream (LU.T3). Printers compatible with SCS include 3287 and 3289 printers and 3777-type RJE workstations.

**LU.T2** is used for communications between a 3270 display device and an application program. The data stream transmitted includes formatting commands embedded with the display data. The commands provide field attributes such as highlighting, color and modifiability and display formatting control information.

**LU.T3** is similar to the LU.T2 except that the display device in this case is a 3270 printer running in 3270 data stream mode (as opposed to SCS mode). Originally, all 3270-type printers supported only 3270 data streams; SCS capabilities were added later to support LU.T1 communications. The data stream is very like that of a 3270 display station data stream, except that not all attributes are relevant or supported (for example, cursor positioning commands are irrelevant to a printer).

**LU.T4** is used primarily to support much of IBM's office products equipment for both host-to-terminal and terminal-to-terminal communications. The terminal-to-terminal type of communications is somewhat unique among currently defined LU types in that both LUs have the same capabilities and share the same responsibilities. This is known as a peer relationship.

**LU.T6** supports communications between two application programs, whether they both reside within a single host processor or in separate hosts. It supports communications between two CICS regions, two IMS regions or even between a CICS and an IMS region.

It also allows user-written programs to communicate with CICS or IMS using a clean and documented interface. LU.T6 is a more intelligent protocol than those mentioned so far in that it has more sophisticated error-detection and recovery procedures and has access to more powerful data flow commands. LU.T6 pairs additionally have the capability to support parallel sessions (that is, multiple sessions between two single LUs).

**LU.T8** is at once very like LU.T6 and very different from it. Like LU.T6, it is a very intelligent proto-



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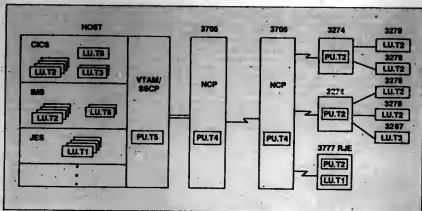


Figure 6. Physical Units and Logical Units

col and is suitable for application-to-application communications. But unlike LU.T6, which is very tightly designed, LU.T0 is open-ended. That is to say, it uses application-dependent message flows, and these may be tailored to meet the specific needs of the application. Also unlike LU.T6, it is not constrained to host-to-host

communications. LU.T0 provides "roll-your-own" capabilities. It offers great flexibility, but the price paid is the added responsibilities that the application must assume in defining and regulating its communications.

We are almost at a point where a significant group of concepts can be

tied into a comprehensible package. One more major SNA concept needs to be presented first: that of the session. First refer to Figure 6 in which various PUs and LUs are distributed in a single-domain network. Now, the whole purpose of the network is to enable communications between end users, and we know that the LUs

are the interfaces between the end users and the networks.

The session is the basic mechanism that ultimately allows those LUs to communicate in coordination with their attached PUs and the SSCP. A session is the establishment of communications between two nodes. In a single-domain network, there are three types of sessions.

SSCP-PU sessions are established by the SSCP. They define the ownership of a PU by the SSCP and allow the SSCP to confirm a PU's active status.

SSCP-LU sessions are also established by the SSCP. They permit the SSCP to determine if the LU is available and willing to engage in a session with another LU.

LU-LU sessions may be established by either LU in cooperation with the SSCP. They are required before application data may be exchanged between the end users. The initiation of an LU-LU session involves establishing an agreement for convention rules between the LU partners.

Using the simple network shown in Figure 6, we can follow the process of a user at a terminal logging onto an application like CICS as a basis for illustrating the types and sequence of session establishment.

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• First, the SSCP must establish a session with each physical unit (the host itself is a PU.TS and the SSCP is effectively in session with itself when Vtam is brought up). The SSCP-PU sessions will be established either at the direction of control tables loaded into the SSCP during Vtam start-up or at the direction of the network operator at a later time. At this point, the only data that can flow is maintenance statistics.

• Next, SSCP-LU sessions are established with all LUs defined to the SSCP (or like SSCP-PU sessions, these may be explicitly initiated by a command from the network operator). It is at this time that the LOGON menus will appear on a terminal.

• The terminal may now be used to log on to an application in the host. The terminal operator enters the LOGON request, which is passed on to Vtam.

• Vtam then contacts the requested application, informing it of the terminal's desire to establish a session. If the application finds the terminal acceptable, it returns a request to BIND the LU-LU session.

• When the terminal sends back a positive response, the LU-LU session is activated, and the operator is now in a position to utilize the facilities of the application.

***At the conversational level of a session between two end users, such as an operator in session with TSO, there is a dialogue that is much like two people conversing.***

Thus, four sessions are involved in this process: an SSCP-PU, two SSCP-LUs and an LU-LU. The SSCP-PU and SSCP-LU sessions remain active and the LU-LU session is started and are available to initiate and service other LU-LU sessions.

## Route Selection

In the preceding example of session establishment, there was no problem in deciding which data links to use in the exchange of information for any of the sessions, since there was only one route between the terminal and the host, and indeed this was always the case prior to Release 3 of Vtam.

But recall from the earlier discussion that with Release 3, several significant SNA enhancements made possible a selection of end-to-end transmission paths by providing multiple levels of remoteness for 3703s, transmission groups and par-

allel transmission groups between adjacent 3703s (as was illustrated in Figure 4). These new capabilities necessitated a mechanism by which the SSCP could select the most suitable route for establishing sessions, and thus were born explicit and virtual routes.

An explicit route (ER) defines an end-to-end path between two major subarea nodes (PU.TS or PU.T4), one end of which must be a PU.TS. Major nodes between the end nodes must be PU.T4s. An ER definition specifies exactly one transmission group between each pair of major nodes along the route (a channel connection from a host processor to its local 3703 is considered a transmission group). ERs must be reversible (that is, the physical path information uses flow in one direction must be the same physical path on which it flows in the opposite direction).

ERs define only a data path; they

cannot be assigned with attributes such as priority. However, ERs are used as the basis for the definition of virtual routes, which do have those attributes.

A virtual route (VR) is used to define the path between two LUs in the network. A VR must be mapped onto an ER from one end of PU.TS to another major node along the route. But because a VR is between two LUs and an ER is only between major nodes, a route extension (REX) is used to complete the definition of a VR. Figure 7 (on In Depth/42) illustrates a network upon which is defined several ERs and VRs.

In choosing a VR for an LU-LU session, the SSCP will consult a table containing one or more virtual routes available for the session. It will assign a VR to a session based on a priority scheme assigned at network generation time. If this route is, for some reason, unavailable, it will attempt to assign the next highest priority route that is available.

Neither VRs nor ERs are physical circuits running from the originating node to the terminating node. Instead, information is packaged into transmittable units, sometimes called frames, which proceed one link at a time from node to node along the route. Upon receipt of a frame in an

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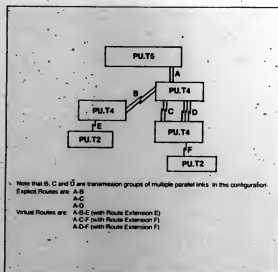


Figure 7. Explicit and Virtual Routes

intermediate node's buffer, that node must determine the next node to which it must be passed, and it may have to retain the frame a short time until facilities for this forwarding process are available.

Those familiar with the concept of packet switching will recognize this method to be in that category.

#### Transmissions, Acknowledgments

At the conversational level of a session between two end users, such as an operator in session with TSO, there is a dialogue that is much like two people conversing. The operator keys in a request for certain services, there follows a reply to the request which may in itself be another request, and the dialogue continues in this fashion.

At the network level, the terminology is different. Every transmission, whether that of a network command or user data, or a combination

of those, is called a request unit (RU). This choice of terms may seem unusual; after all, why call a command or even a block of data a request? The reason is that the extreme level of cooperation needed among network components and the intricate protocols defined to ensure that cooperation require that most transmissions be, effectively, requests.

Thus, a command of "Do ABC" is usually implicitly "Can you do ABC? Answer yes or no." Likewise, a transmission of end-user data is usually implicitly "Will you accept this data? Answer yes if so." In SNA, the answers to requests are called request responses (RR); they are acknowledgments to the originator of a request that the request has been accepted or that a problem has been detected. There are several possible protocols for responses to requests:

**Definite Response:** A response is required whether processing is suc-

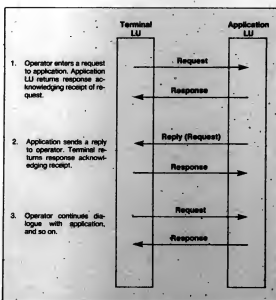


Figure 8. Requests, Responses and Replies

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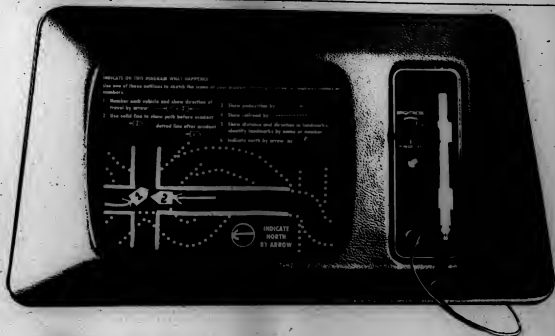
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## IN DEPTH



# On-Line Insurance

By Kenneth E. Lantz

Computer systems have greatly changed the operation of today's organizations, but...

- Input is still often batch, or if there is on-line input, it is input to a file for overnight update in batch mode. The input comes primarily from company employees, with a few exceptions, such as via automatic teller machines (ATM):

- Output usually takes batch form — reports delivered to company employees. Some limited inquiry is being used, but it is usually preprogrammed. A management information systems (MIS) analyst has anticipated exactly what a user might want to know, and a programmer has set up specific inquiry transactions to help him.

- Data is usually kept in what are really files, although we started calling them data bases more than 10 years ago. True data bases are single files updated and used by more than one system.

The average insurance company's systems typify today's systems. Data is still passed from system to system. For instance, the insurance policy system may

pass information to the claims system with a substantial time lag. Often, the claims system has no direct way to access policy data. When a claim is entered, the adjuster quite often must input policy information manually at the same time.

The underwriting and policy issue processes are still a mixture of manual and computerized processes for most insurance companies.

When an agent or broker receives a request for coverage, he completes an application with information he receives from and about the prospective insured. The completed application goes to an underwriter, who uses rate tables, experience reports and actuarial studies to determine whether to propose coverage and what premium to charge. The underwriter prepares a quotation for the agent or broker to take back to the applicant.

The underwriter may have used the computer system to review rates. The experience reports he consulted may have been prepared on the computer. If he decides to cover the risk, the system may actually prepare the quotation. Then, if the applicant accepts, the

*By 1990, insurance companies will keep information in true data bases, not copied from file to file. Underwriters and adjusters will have on-line access. Customers may even deal directly with the company's mainframe to apply for a policy or settle problems.*

## IN DEPTH

computer system may issue the binder and policy.

When there is a claim today, the insured may first call an adjuster to alert him to the possible loss. The adjuster gathers preliminary information from the insured and then calls the insurance company's claims department.

Claims department personnel establish a paper file and enter some data into a computer system. Part of that data may be information about coverage that is not available from the policy management system.

Claims department management assigns supervisors, attorneys and adjusters. Reserves are established, reinsurers notified, payments made, reports produced and, someday, with luck, the claim will be closed.

In current insurance systems, employees usually work with batch input and output that is processed by computer systems whose primary function is to perform relatively simple, repetitive, voluminous tasks. The evolution of today's systems has been limited by how much hardware and software has developed and by

how much the systems designers have understood the organization's operations.

## Future Systems

Computerized systems will have changed more by 1990 than we think possible. They will truly become what we now claim they are.

Input that doesn't come from other computerized systems generally will be entered through an on-line update process and may be entered by nonemployees. Responses to inquiries, which are a form of output,

will be made on-line if they are not voluminous. Some reports will still be generated, but many transactions may be produced on-line, possibly with later paper confirmation. Also, some output may go directly to non-employees.

Information will be kept in true data bases, not copied from file to file either by computer or, as in the earlier claims example, manually. We should no longer need to ask questions about the data, such as, "What date was it entered? Was it copied after yesterday's or today's file update?"

An important feature of the coming operational systems is that they will allow whoever needs to work with the data — an actuary, accountant or a product development manager — to examine, manipulate and analyze it while sitting at a workstation.

The production, communication, storage and use of information through computerized systems will occupy much of the business day for most people in such segments of American industry as insurance and banking. In 1990, a prospective insured may learn about a new type of policy through a videotex "consumer" from the insurance company. If he wants to apply, the videotex system will connect the insured's home terminal to one of the insurance company's mainframes.

The mainframe will collect and evaluate background information on the customer, determine whether to provide coverage, rate him and give a quotation — all while he waits.

If he accepts, the mainframe will debit his bank account for the initial premium and transmit a binder screen, which the potential insured may print on his printer. The mainframe will later print a policy in batch mode to be mailed to the insured.

In 1990, an insured may still call an independent claims adjuster to notify him about a loss. While the customer is on the phone, the adjuster may load a claims report screen on his workstation. (The insurance company's mainframe downloads the latest version of the screen whenever it changes.)

The adjuster will use the screen as a guide for taking information from the insured. The program downloaded with the screen won't verify coverage, but it will do such things as check the characteristics of the policy number and catch an alpha character entered as part of the Zip Code. After he has completed working on the screen, the adjuster may transmit the claims report to the mainframe.

The mainframe will probably verify the information in the claim report as soon as it is received. If a problem is found — such as an incorrect policy number — the mainframe itself may call the insured, use a voice synthesizer to ask for the correct policy number and recognize and record what the insured says in response.

What will companies use in the

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future to develop operational systems? Three factors will be important:

- System development methodologies.

- User-friendly languages.

- Artificial intelligence (AI) systems.

System development methodologies, most likely involving prototyping, will be used for those systems that are jointly developed by users and MIS people. These jointly developed systems, though operational, will be focused primarily on establishing and maintaining data bases. That will be the principal reason for MIS participation, since data bases will be of major concern to MIS.

Users will be responsible for stating the operational requirements of the system. They will also contribute knowledge of their data and its uses to such a joint development effort. MIS people will contribute their knowledge of the company's data and the plans for its use.

In the world of the 1990s, users may be primarily responsible for developing non-data base systems. Consider the case of a user who wants to develop a new weekly report of all insurance claims requiring reserves in excess of \$5,000. With a user-friendly language, he would only need to mention the name of the data base that contains the information he wants — in this case, the data base with claims information. Using a workstation, he would describe what he wants the report to look like and where he wants each field to be placed. He might also need to list the information element names that he will be using.

If a standard layout is acceptable for the report, he will only need to list the element names. If he mentions a name that is not in the data dictionary, the dictionary system will question him and help him to select a name it recognizes.

The user will need to specify when the report should be produced, what kind of paper stock it should be printed on and to whom it should be delivered. He will also need to specify that a line should be produced on the report to indicate a claims reserve or reserve change exceeding \$5,000.

The line between user-friendly languages and AI systems may become greatly blurred by the end of the decade. How will AI systems work? Let's say a user wants to develop a new underwriting system, but he isn't sure how to begin. He might initiate a conversation with the AI processor and state just that.

The AI processor may begin by asking what data base should be used to determine coverage. The user would answer with the name of the data base that contains the experience, claims, reinsurance, rate and policy data. The processor would find this information in the data dictionary and set itself up to browse through the actual data base.

Next, it might ask what states the underwriting process. Eventually, the processor would have a descrip-

*By 1990, if a user wants to develop a new underwriting system, but isn't sure how to begin, he might start a conversation with an AI processor and state just that. When he has gone as far as he can in working with the processor, it may have built a system that can handle 70% of the underwriting process.*

tion of all principal input and output of the underwriting process. The AI processor may then engage

the user in a conversation about the underwriting process. What does an underwriter look at when he re-

ceives an application? What does he look at first? If the application is for property insurance, some of the first things looked at might be location, class, amount of coverage desired and deductible amount. One by one, the AI system would ask what part of the data base the user would look at for each of the underwriting elements, what kind of information he would be looking for and what kinds of decisions he would make based on what he found.

Maybe the user will not have any idea what is done with certain infor-



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mation. Then the AI processor may scan the data base with him, offering hypotheses for his consideration. It will try to produce a list of possible decisions.

When the user has gone as far as he can in working with the AI processor (which could take weeks), it may have built a system that can handle 70% of the underwriting process. The user may decide to have the underwriters, who will handle the remaining 30%, plug into the AI processor as they work.

The system developed by the processor will take care of what it can and then hand the application to the underwriter. As the underwriter does his part, the AI processor will ask him what he did and why he did it. As time passes, the system will be able to take over more and more of the process, although it may never handle 100%.

## User Workstations

By 1990, the workstation should include a keyboard with at least as many keys as a terminal has now; a large, but quite thin, full-color TV-compatible screen; a handset (think telephone); a lightpen; and a communications line and memory, too, but they will be small.

Will a user have a personal computer at his desk by 1990? The workstation will provide access to personal computing, and it will evolve from the personal computer of today. At a workstation, the user will be able to produce, store, retrieve, manipulate and analyze information located in personal, corporate and external data bases.

When asking for data from a data base, the user need not give the names of the elements he wishes to use, only the name of the data base itself. The processor — a spreadsheet processor — in this example — and the data dictionary will determine the specific information needed and provide it.

Let's assume that while the user is working, he receives a message across the bottom of the screen, accompanied by an audible tone, that he is to attend a video conference from his office. He might save what he is working on in order to call up review notes for the conference that he had made a few days before. As he looks there over on the screen, he will change phrases he doesn't like. To get a hard

copy of the notes, which may fill about two screens, he can request they be printed, perhaps in full color.

When the conference begins, the user may split his screen. Most of the attendees may be together in a conference room in London. They

will appear in the left two-thirds of the screen. Two people attending together from Boston will appear in the upper right one-sixth of the screen. The other attendees from Omaha will appear in the lower right one-sixth. The full screen may be de-

voted to any one person at any time. Not only can the user see and hear them, but they can see and hear him because the workstation will also contain a concealed microphone and camera.

The user might also split his screen to call up any mail

he might have. He might make another temporary split in the screen to page through his calendar.

If a user takes a public speaking course, it will be transmitted to his workstation. If he wants some information from a videotex ser-



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vice, he will view it there. If he wants to use the service to transfer funds from his savings account, he can also do it at his workstation.

When a user is working with the AI processor to develop an underwriting system, he will do it at his workstation.

When he is composing a report, he will do it at his workstation. The user may also wish some deluxe features on the workstation, such as the capability to make audio or video recordings of his workstation's activity.

At this point, some analysis of the workday world of 1990 computer systems should be attempted. What will all this hardware and software be working on, sending, changing, producing, creating, deleting? They will be operating on information in two forms: messages and data bases.

Messages may be thought of as information in motion and data bases as information at rest.

The functions to be performed on the information are transmission, storage,

processing and reception.

Hardware will be used to perform the functions. We used to think of the basic hardware components as input, output, storage, processing and control. The components we will be focusing on in the 1990s will consist of terminals, storage, communications networks and processors.

The use of the word "terminal" doesn't feel right at first, but it's the best word for what needs to be described. Workstations will be terminals, and they will fit most people's idea of what a terminal is. The printer that receives a report will also be a terminal. So will be a cash register in a point-of-sale system, a video camera, an optical character reader and a voice synthesizer.

A terminal as described here is something that is hung on a network to send or receive messages — as well as 5,000-page reports. Storage will be a place where processors put information for later retrieval and reintroduction to a processor. The latter point is important to the concept: If a processor puts information on microfiche, from which it can later be retrieved by a processor and sent back over a network as a message, then the microfiche is storage.

If, once the data is on microfiche, people can look at it with viewers and make copies — but a processor can't use it — then whatever put the data on microfiche will be a terminal, not a storage device.

Processors will be computers.

Communications networks will consist of lines, whether voice-grade, private, optical fiber, cable, satellite transmission — whatever the future holds — and the processors that control them.

In a sense, hardware will all be part of a network that the user will join when he sits at a workstation. Such an environment recalls Teilhard de Chardin's "Noosphere" — everything in the network will have an address. Minds and data bases will be connected through networks in which processors will expand the capabilities of the human. Yet the whole may become much more than the sum of its parts.

Hardware performs functions on messages and data bases, but not on its own initiative. Software uses hardware to operate on messages and data bases.

*Bob,*  
*I want a report*  
*planning dates and*  
*times when TSO*  
*response has exceeded*  
*5 seconds for the*  
*last 3 months*  
*H.T.*

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*to our response time?*  
*My programs are*  
*can't get any link*  
*done*  
*RJT*

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## ON-LINE INSURANCE

In Depth/50

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The major software components will be:

- Information managers.
- Network managers.
- Processor managers.
- Development processors producing operational systems.
- Information processors enabling "symbiotic systems."

Information managers will include data base management systems (DBMS) and data dictionaries.

Network manager software, residing in processors, will control all facets of communications within a net-

work, as well as to and from external networks. It will include transmission, message switching, error detection and correction, encryption and decryption, access authorization and maintenance of usage statistics.

Processor managers will be operating systems.

Development processors will include user-friendly language processors, AI processors, report writers and whatever form language processors, such as Cobol, will take.

They will produce the operational systems that will maintain data bases

and perform the information-based processes essential to organizations.

Information processors will include inquiry and report language processors; analysis systems, such as spreadsheet processors; simulation language processors and text editors. They will be used for symbiotic systems.

Symbiotic systems are systems in which the person who initiates the conversation also controls its form and direction, while using one or more person-extending systems.

In contrast, operational systems

are ones in which, even though a person may initiate the conversation, the system itself controls the conversation's form and direction. An insurance claims system would be an example of the latter.

Whatever became of stand-alone word processors, office automation, information centers and personal computers in a business environment?

They served their purpose as intermediate steps along the way.

Word processors taught users the indispensability of computerized text editing.

Office automation showed users some of the things that could be done with internal information networks.

Information centers taught users how to draw directly on computerized data and showed MIS people that their primary concern must be information, not programs.

Personal computers were the first workstation, but more important, they were the catalyst that sped up everything that happened in the '80s.

#### Survival Guidelines

Nothing an organization does will be irrevocably bad, but some methods will certainly turn out better than others. DBMS will change; terminals will change; operational systems will change; communications lines will change. As time passes, these changes will become easier to make because more and more software and hardware aids will be available for changing and converting.

Nonetheless, as Rule 1 for the '90s, I would propose the following: The more distinctly a thing is what it is, the less it will hamper development.

The more a DBMS is a distinct DBMS, rather than being embedded within something else, such as an application package, the easier it may be replaced with another DBMS. If it is contained within an application package, the application package may have to be modified or replaced before an improved DBMS may be used.

The more a data dictionary is a separate entity, rather than being part of a DBMS, the easier it may be replaced with an improved data dictionary.

The less an inquiry language is part of a DBMS or a data dictionary system, the more easily it may work with most DBMS and data dictionaries and the less it will be affected by a change in either.

So beware of black-box solutions to systems problems. The more facets of software or hardware that a vendor's product bundles together, away from the user's control, the more it locks in the user and the less freedom his systems will have to evolve and progress without it.

#### Portfolio of Application Software

Application software packages available in 1990 will probably be of two main types. The first will be generators that will allow the user to use

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CT

## IN DEPTH

his own data dictionary and DBMS. They will contain the main thrust of the operational processing that the organization needs, but they may be tailored to fit the user's needs and tastes.

The second type of package will bundle the operational processing with the DBMS, possibly the data dictionary function and even the report-writing function. If an organization needs such packages, it will probably also need people from the outside to design and maintain its hardware configuration and commu-

nications network.

Nothing is more central to an organization's uniqueness than how it uses information. Consequently, how the user would define and structure information in a data dictionary is also unique. The user should not abdicate definition of his data to the vendors of application packages.

Somehow MIS must look beyond the distractions of an ever-increasing backlog of requests, frustrated end users and an explosion of hardware and software products to begin man-

aging information. MIS must accept responsibility for the organization's information.

MIS people must become experts in the organization's data. If a formalized data dictionary effort has not been started, MIS managers should push to have one started. They should encourage the creation of true data bases whose contents are defined in a data dictionary.

Ideas need time to gain acceptance. Many installations are just now recognizing the value of following a standard life-cycle approach for

systems development. But the development and freezing of detailed requirements as the basis for systems design will not produce systems that please users.

What is needed for the '80s is a methodology for change. Prototyping is such a methodology. End users need to be more closely involved with the design and modification of systems. Prototyping keeps them involved on a day-to-day basis.

Users need experience in user-friendly languages to help them learn how to produce their own operational systems. If you have already set up an information center, make sure you have staffed it well and are properly selling its use.

While an information center is important to users for learning user-friendly languages, it is even more important to MIS. The job of supporting an information center begins to tilt MIS toward providing information and away from processing it. It's a healthy tilt.

Nothing short of a caesary will stop end users from acquiring personal computers in vast numbers. And, despite what many senior managers in MIS think, the users will not produce mammoth problems with personal computers, nor get frustrated with them, nor tire of them enough to stem their spread. Granted that the software available for personal computers last year was not easy to use, it is quite a bit better this year.

MIS managers would be wise to proceed as follows: First, develop a plan for integrating personal computers into the network, including providing for downloading and uploading information. Second, determine the characteristics of personal computers that will fit the plan. Third, secure the services of people to help the users pick names, find software for them, install them, hang them on the network and use them. Then send those people out to join the users, not to fight them.

Last to be mentioned, but almost first in importance, is the communications network. Strive to have the organization combine the responsibility for voice and data communications and, more important, for message communications and information storage. Expand the organization's expertise in the design and management of communications systems.

#### About the Author

Kenneth Lentz is a principal with Atwater, Lentz, Hunter and Co., management consultants in Woodland Hills, Calif. He has worked for 27 years with more than 200 organizations as an information systems consultant, data center director, president of a software house, analyst and programmer.

Lentz headed IBM's application development project for computer-aided manufacturing and has developed decision table languages, data dictionary systems and systems methodologies.

He is currently writing a book on prototyping.

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WHERE IMAGINATION LEADS

## To Access Bank Accounts

# Mobil Unveils On-Line Payment Project

By Peter Bartolik  
CW Staff

WASHINGTON, D.C. — The first on-line transaction system that would allow consumers around the nation to use bank debit cards for retail purchases was announced here recently by Mobil Oil Corp. The system, which will be initiated in this area, will enable Mobil to receive immediate payments electronically from consumer bank accounts for purchases around the country at 2,600 gas stations that account for more than 50% of its gasoline pumping operations.

It is likely Mobil will activate the first nationwide retail-level electronic payments system, known under a variety of names, such as direct debit point-of-sale, retail-level electronic funds transfer and

*'We had two objectives, operational feasibility and customer acceptance. We were less concerned with the technical aspect, [and] we're very pleased in both areas.' — Thomas Lewis, vice-president at Virginia National Bank and manager for Mobil Oil Co.'s debit card test project.*

others. Several major gasoline companies have announced experimental systems in particular areas of the country, and various bank-sponsored regional systems have also been announced; Mobil, however, is the first organization to announce definite

plans for a nationwide system.

Within two or three months, holders of bank debit cards in the Washington, D.C., and northern Virginia areas will be able to present their cards as payment for gasoline at 70 Mobil stations in the area, the company announced. The shared automated teller machine (ATM) cards, Most and Cash Flow, representing more than 50 area banks, have signed agreements with Mobil to transfer funds from customers' accounts.

Most is the shared network operated by the EFT Group, Inc., a system serving 52 banks in the Washington-Maryland-Virginia area, including American Security Bank and Bank of Virginia. Cash Flow is a network comprised of Virginia National Bank, Riggs National Bank, Mercantile Safe Deposit and Trust Co. and Citizens Trust Bank.

According to Walter D. Manz, Mobil's general manager of marketing systems and control, the stations will be equipped with terminals that will transfer debit card identification to Mobil's credit center in Kansas City, Mo. From there, the information will be switched back to the ATM network for an automatic transfer from the customer's checking or savings account. (Continued on Page 104)

## Micro-Based Operating System Out

SAN DIEGO — Softech Microsystems, Inc., a firm that got its start marketing UCSD Pascal, has brought out an operating system for microcomputer networks.

The operating system — called Liaison — provides a way of linking together microcomputers that were previously unable to communicate with each other, according to John I. Spilavec, president of the wholly owned subsidiary of Softech, Inc. In a demonstration held recently, equipment from IBM, Apple Computer, Inc., Texas In-

struments, Inc., and Corvus Systems, Inc. was shown operating on the same network.

Liaison is actually a superset of the company's "P-system," its UCSD Pascal operating code. The software is intended for multitasking and multiple users and can support a number of users constrained only by the hardware wired to the network, a company spokesman said.

The operating system also includes a (Continued on Page 108)

## Lee Data Adds Dual Controller To 300 Series of Control Units

MINNEAPOLIS — Lee Data Corp. recently announced the addition of a dual host controller to its 300 series of standard IBM 3274-compatible control units.

The Model 311 dual host controller reportedly offers dual remote host access capability and contains two remote communication interfaces that operate concurrently to enable display stations to switch freely between two selected IBM or compatible mainframes through keyboard commands.

The 311 operates in both Binary Syn-

chronous Communications or Systems Network Architecture/Synchronous Data Link Control combination and supports up to 32 display stations and printers. It can be configured to provide application redundancy or host backup for uninterrupted processing in the case of host failure or communication interruptions.

The unit is available for a purchase price of \$14,215, or a lease price of \$591 per month on a three-year lease from Lee Data, 7075 Flying Cloud Drive, Minneapolis, Minn. 55344.

## Multiplexer Supports Controller In Providing Greater Port Count

ANAHEIM, Calif. — California Computer Products, Inc. (Calcomp) has unveiled a communications multiplexer that works in conjunction with the firm's Model 951/953 plotter controller to increase its maximum number of allowable data streams from one to four outputs.

All of the ports on the device, called the 4 to 1 Input Multiplexer, can be independently configured to accept serial data in Calcomp's 960 or 907 plotting formats.

Basically, the unit's priority scheme allows the user to select ports for preferential access, a spokesman pointed out.

The device will screen for any active ports to allow plotting to proceed or put other ports in a wait-state until a job is

completed, according to the firm.

The multiplexer also reportedly allows users to recover from host errors. Using a "dead host timeout," a port is automatically released if data is not received within a user-specified interval, the spokesman noted.

In addition, time intervals on the device are user-selectable, so the unit can be altered to accommodate various connecting devices and lines.

The 4 to 1 Multiplexer operates at communications rates of from 300 to 19.2K bit/sec. Since it is contained on a single board, the device can be installed in the field, a spokesman explained.

The multiplexer costs \$1,995 and can be delivered in 60 to 90 days from Calcomp, headquartered at 2411 W. La Palma Ave., Anaheim, Calif. 92801.

## Decnet Users Get Controller to Access MVS-Based Files

FREMONT, Calif. — Interlink Computer Sciences, Inc. has announced an integrated hardware and software controller system that is said to allow users of Digital Equipment Corp.'s Decnet network to access MVS-based mainframe files.

Called System 3711, the device allows users on Decnet to retrieve information from IBM data bases down to the record level, without physically keying in IBM protocols and communications procedures, a spokesman said.

The system combines hardware — a network controller — and Decnet software with Interlink-designed host-resident software that functions in International Standards Organization Level 7, said to be the highest level of communications in a layered network architecture. The network controller actually functions as an intelligent front-end processor linked to the IBM system via a high-speed data communications channel.

The host-resident software — Master, Control and Translator modules — reportedly allows DEC users to share information to and from IBM data bases.

Software features of the package include: dynamic file access at the record level, without entering batch mode and without need for JCL; data security via Cambridge Systems Group and IBM protocols; error messaging; and transparent data translation as well as support of multiple data records.

The System 3711, including the network controller hardware and IBM host-resident software, is priced from \$98,500. Shipments are scheduled to begin in January from Interlink at Suite 203, 39055 Hastings St., Fremont, Calif. 94538.

COMMUNICATIONS

## First Package in NDS-Series

## 'Multipoint Network Design' Fits IBM Micros

WEST BRIDGEWATER, Mass. — Connections, Inc. has announced Multipoint Network Design software, the first package in its NDS-Series for use on IBM Personal Computers and other microcomputers.

Designed to analyze performance characteristics such as response time, system utilization, topological configurations and cost variables of any size network, the software features English-language prompting with a hierarchy of commands and file structure.

The network data base is stored on diskettes, the vendor said.

Modeling and topological optimization are achieved by using queue-

ing models and linking algorithms, the company explained.

The software allows the user to define all network parameters, and a menu-driven screen lets the user build libraries of all variable proto-

cols and tariffs for modeling run comparisons, a spokesman said. The results of any network design can be compared graphically against other alternatives, and gross statistics on network traffic or application vol-

umes may be input.

Multipoint Network Design software costs \$3,500, the vendor said. Connections is located at 322 E. Center St., West Bridgewater, Mass. 02379.

## Mobil Oil Inaugurates Instant Payment Plan

(Continued from Page 103)

into Mobil's account.

Mobil tested the system in the Tidewater region of Virginia in cooperation with Virginia National Bank, which operates the Cash Flow network switch, built around an IBM 370/158. The software to allow com-

munications between Mobil's terminal-to-Tandem system and the bank ATM networks was developed by Mobil.

Thomas Lewis, vice-president at Virginia National Bank, was manager for the Mobil test project and he told *Computerworld*, "We had two ob-

jectives, operational feasibility and customer acceptance. We were less concerned with the technical aspect. We're very pleased in both areas."

Manz said Mobil is already installing terminals in California and plans to move "as rapidly as we can" to complete installations at the 2,400 stations nationwide. The terminals are custom-made for Mobil by Datatrol, Inc. of Hudson, Mass., and will communicate over leased telephone lines to the switch, a Tandem Computers, Inc. Non-Stop II computer system.

The terminals will also process Mobil credit cards along with Visa and Mastercard credit cards.

While Mobil has 15,000 to 16,000 stations around the country, the terminals are being placed "in the 2,400 that are the high-volume stations that do a lot of credit card transactions and cover well over 50% of our gas operations," Manz said. Following California, installations will be extended next year to the Northeast, Florida and Texas.

Manz said it will take 60 to 90 days to "get the software in place and operating" at the Washington networks, at which point customers of member banks will be able to use their debit cards at any terminal-equipped gas station. He said the company will negotiate with other ATM networks in the areas.

Donald O'Connor, president of the EFT Group that operates Most through a switch maintained by NCR Corp., said the Mobil transactions will have little impact on the performance of the network. "It's certainly going to increase volume at the switch level, but it does not require any modifications. It doesn't look any different than an ATM transaction."

Virginia National's Lewis agreed. "There's some effort involved, but once it's up and running it's a typical day-to-day operation really," he said. Preparing for the actual machine-to-machine communication, he said, "is an interface project" establishing protocol flows and message flows.

Mobil's system took 2½ years to develop and was extensively field-tested, Manz said. Although automated fuel dispensers that accept debit and credit cards are presently being manufactured and installed around the country by several gas companies and computer equipment vendors, Mobil decided not to select that path for now.

"We had no problem with consumers using the card-activated pump, but we really couldn't justify the cost or see any economic benefit," Manz said. While conversion units to enable pumps to dispense automatically gas cost in excess of \$10,000, typical card terminals are selling for several hundred dollars.



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# DATAPRODUCTS

## *The Printer Company*



## Features Autospeed Capability Limited-Distance Modem Unveiled

CHERRY HILL, N.J. — Datatel, Inc. has unveiled a limited-distance modem that is geared for use in close communications applications where transmission distances are short.

The DCP3055 features an auto-speed capability, reportedly giving it some advantages in statistical multiplexing and full-circuit applications. The limited-distance modem, working at a remote multiplexer, is designed to sense any operator changes on communications lines and adjust the line speed accordingly.

A similar unit at the end of the tail circuit also senses any line-speed changes and will alter its operating speed, a spokesman claimed.

### Used With DCP3050

The DCP3055 can be used in conjunction with the firm's DCP3050, which is similar to the first unit but does not have the autospeed capability. Instead, this unit provides for speed selection via a front-panel rotary switch.

A typical application would have the 3050 at a central computer site transmitting to an autospeed 3055 at



Datatel's DCP3055

an unattended remote site. The remote unit would change line speeds automatically in response to changes made on the local unit, the spokesman claimed.

The DCP3055 operates at speeds from 1,200 to 19,200 bit/sec, in both synchronous and asynchronous applications. Asynchronously, it will reportedly operate at speeds up to 64K bit/sec.

It also provides full-duplex transmission over four wires, at ranges depending on the data rate and wire

size, the spokesman added.

The unit appears as an RS-232C interface to the user's computer or peripheral and conforms to Bell Publication 43401 requirements.

Other features include built-in diagnostics and front-panel indicators. The unit is available in a module version for installation in a Datatel equipment nest, the spokesman explained.

Prices for the DCP3055 range from \$440 to \$550, depending on quantity. Additional details on the device can be obtained from Datatel.

Datatel is located at Pin Oak & Springdale Roads, Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.

## Net System Gives Users Access to Files

CONCORD, Mass. — Xyplex, Inc. has introduced a terminal switch and front-end networking system said to provide users with access to computer files while reducing direct wiring requirements.

The system includes an XP-UN64-A Unibus host interface unit for Digital Equipment Corp.'s VAX-11 and PDP-11 minicomputers, running DEC's VMS or RSX operating systems and the XP-CB-A terminal-cluster controller, providing connections for up to eight terminals.

Within a local environment, a single cable can reportedly be used to connect terminals and computers, allowing a user to access the computers or other terminals.

System management functions are said to be integrated into the computers with host interface units, including system performance information, configuration data bases and diagnostic tools.

The host interface unit is priced at \$9,500, and the cluster controller costs \$5,600 from Xyplex at 100 Domino Drive, Concord, Mass. 01742.

## HP Interface Kit Connects to Net

PALO ALTO, Calif. — Hewlett-Packard Co. has announced an interface kit that allows the HP 4955A protocol analyzer to connect physically to an ANSI X.21 public network.

The interface kit, HP 18136A, provides a cable with X.21 15-pin connectors for use with the vendor's RS-449 interface pod, the HP 18136A, for the physical connection.

Included in the kit is display software allowing simultaneous viewing of both character- and bit-oriented protocols, which is said to expand the problem-solving capability of an HP 4955A user.

The HP 18136A interface kit is priced at \$250 and must be used with the HP 18136A interface pod, priced at \$990.

More information is available from HP at 3000 Hanover St., Palo Alto, Calif. 94304.



## Send more information on:

- ☐ PCI 1076: ASCII to SNA/SDLC 3270 emulation.
- ☐ PCI 1051: ASCII to Sys 34/36/38 5251 emulation.
- ☐ PCI 1067: SNA/SDLC to ASCII 3767 emulation. The NTO alternative.
- ☐ PCI 718/SNA: BSC 3271 to SNA/SDLC 3274 emulation.
- ☐ PCI 758/SNA: BSC 3275 to SNA/SDLC 3276 emulation.
- ☐ PCI 1071: ASCII to BSC 3270 emulation.
- ☐ PCI 3780/SNA: SNA/SDLC to BSC 3780 emulation.
- ☐ Videotex 67: SNA/SDLC to Videotex protocol conversion.
- ☐ PCI's X.25 Series: PCI 735X and PCI R735X/SNA/SDLC to X.25 protocol converters for host and terminal connections respectively.
- ☐ PCI 1076X: ASCII to 3270 SNA/SDLC through X.25 networks, PAD included.
- ☐ PCI's Networkers: Keystroke for keystroke 5251/11 and 3278 keyboard compatible ASCII CRTs.
- ☐ PCI's IBM-PC software packages: For 3270 and System 34/36/38 emulation.
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## Bell-Compatible Modem Introduced by Gandalf Data

WHEELING, Ill. — Gandalf Data, Inc. has introduced the second modem in its synchronous/asynchronous Bell-compatible modem line.

The SAM 201 is a 2,400 bit/sec modem designed for switched networks, unconditioned, 3002-type lines or two- or four-wire voiceband private lines.

Unlike other Bell-compatible 201C modems, the SAM 201 operates in synchronous and asynchronous modes. In the synchronous mode, the SAM 201 is compatible

with other 201C and CCITT V.26 Option A and B modems. In the asynchronous mode, the SAM 201 communicates with another SAM 201 modem.

SAM 201 features a built-in auto-answer for use on the switched network. It can also be used with an 801-type auto-dialer. Both rack-mount and stand-alone units are available.

Stand-alone units are priced at \$725. More information is available from Gandalf Data at 1019 S. Noel, Wheeling, Ill. 60090.

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with the protocol controller using more efficient, high speed, asynchronous SDLC or BSC line disciplines.

In addition, PCI protocol converters allow your ASCII terminals to emulate 3270 full screen operation. So you can access SPX full screen editors and any utilities available to a 3270. Which means more productive use from your graphics hardware, even when it's not doing graphics.

There are a lot more graphic examples of what PCI protocol converters can do for your graphic devices. So if you've been having communications problems with computer graphics on your IBM system,

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# Response Time Analyzer Out for IBM Net Users

EAST NORWALK, Conn. — A data collection instrument that measures performance levels and the efficiency of IBM data communications networks

has been announced by Datacom Management Sciences, Inc.

The RTA-327II response time analyzer was designed to be used with IBM Binary

Synchronous Communications or Synchronous Data Link Control/Systems Network Architecture protocols and can operate with IBM 3271, 3274, 3276 or equivalent terminals.

The unit permits simultaneous measurements of user-perceived response time; host and polling delays; traffic loading; and other significant parameters that impact overall system performance, a spokesman said. The device can measure the performance of an entire circuit, or it can be selective to a specific controller, terminal or software application package via a trapping capability, the spokesman said.

By using the device, a network manager can see system responses and delays as a user would and take the appropriate actions to keep network performance up and costs to a minimum, the spokesman claimed.

All network measurements are made at the CPU site or optionally at a remote location. Performance data is measured and analyzed simultaneously, with each measure-

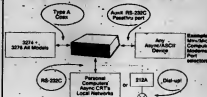
ment report time stamped and routed to the test output. The analyzer costs \$4,875.

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## Service Links 3270 Users To Telenet

VIENNA, Va. — GTE Telenet Communications Corp. recently announced a service enabling IBM 3270 terminal users to access asynchronous host computers connected to the Telenet data network.

GTE Telenet Interface Program (Gtisp) reportedly combines an IBM-based application program with a Telenet network interface, enabling local and remote 3270 terminals to establish switched connections through their host computers to any other asynchronous host application on the network. The service is available for any IBM 370, 4300 series, 3030 series or 3080 series mainframe system with an MVS operating system.

Gtisp functions with both Binary Synchronous Communications and Synchronous Data Link Control 3270 terminals and is fully compatible with IBM's Systems Network Architecture (SNA) and non-SNA systems, a spokesman said.

The service is available for a \$300/mo. incremental charge above the normal Telenet service rate for a leased line connection between the customer host computer and Telenet. More information is available from GTE Telenet, 8229 Boone Blvd., Vienna, Va. 22180.

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Unlike any other company's software packages, Millennium packages aren't walled off from each other by separate programs and commands. So you can cross instantly from one system to the next. You can ask a question in general ledger, immediately seek an answer on-line in accounts payable, and follow the track wherever it leads. Into fixed assets, purchase order management, anywhere. While traditional packages force you to work within the narrow confines of a given application, Millennium creates a limitless environment that enables you to access applications at will. With a single key, you're free to explore the vast entirety of your information universe. No other system works like Millennium, except your own mind.

## 2. Millennium has common functions across all applications.

Let's say you have a half dozen different packages. General ledger, accounts payable, and so on. In the

past, that meant doing everything a half dozen times. Learning the different programs and commands for each application. Training users in data entry procedures for each one. From a training and service standpoint, Millennium is infinitely less complicated because the same set of functions governs all applications. You use, for example, the same real-time update procedures for accounts payable as fixed assets. Functions never change, only the data that defines the particular application. Once you learn one set of functions, you've learned them all. And you quickly find you're faced with a much lighter load of training, documentation and support requirements.

## 3. All Millennium systems are real-time, on-line.

Working in the borderless environment, you perform routine file maintenance on the spot as you cross from system to system. You can update fields, records or any other information in your files instantly. There's no waiting for batch processing. You get accurate, up-to-

# software company give you anything Millennium. od reasons.

the second information the moment you need it.  
Today, not tomorrow when it's too late.

## 4. All Millennium systems are secure and friendly.

Although Millennium is borderless, the security is tighter than any border patrol. Totally comprehensive and user defined. You can set up any restrictions you want, right down to the field level.

Even the on-line HELP feature in Millennium is user-defined. Not only do you get comprehensive on-line documentation from McCormack & Dodge. But you're able to enter your own specific instructions and requirements on-line into the HELP data base, exactly the way you want them. This gives you complete flexibility to define corporate policies and procedures.

Millennium has a special ScreenPaint function that lets you design your own terminal screens quickly and easily. You can see and use your new screen format in a matter of seconds.

## 5. Millennium offers an interactive PC link.

This gives you an enormously powerful and effective managerial tool. Without leaving your desk, you can open up your mainframe to the analytical powers of your personal computer. You can selectively download specific data from the mainframe and study it, manipulate it and graph your results. When you've finished you can upload the data back to the mainframe in minutes.

Clearly, Millennium is the software of tomorrow. But only McCormack & Dodge can install it today.

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## Communications Processor Emulates IBM Controllers

MIAMI — Innovative Electronics, Inc. has announced a communications processor said to emulate an IBM 3271, Models 1 and 2, IBM 3274-51C and IBM 3276, Models 1 and 2, communications controllers.

The MC-80/602 processor reportedly converts a keyboard send/receive device or an asynchronous Ascii host into a full-function IBM 3277-1, 3277-2, 3278-1, 3278-2 terminal communicating with the IBM host using the IBM Binary Synchronous Communications protocol.

A switch selection is said to allow the MC-80/602 to communicate with an asynchronous Ascii host for file transfer, with a blocking feature

built into the MC-80.

Priced at \$1,650, the processor is available from the vendor at 4714 N.W. 165th St., Miami, Fla. 33014.

## Net Said to Handle 10 Workstations

WINTER PARK, Fla. — Control Electronics, Inc. has announced a networking system said to handle up to 10 workstations, each with its own Zilog, Inc. Z80A or Z80B processor and 64K bytes of internal memory.

Control/Net is said to operate under the Turbodies operating system, which is compatible with Digital Research, Inc.'s CP/M operating system. Control/Net reportedly in-

cludes one 8-in. double-sided floppy disk and a choice of 127M, 20M, 40M or 80M-bytes of 5 1/4-in. Winchester hard disk storage.

The system is reportedly based on the IEEE 5-100 bus, with up to 20 slots for user expansion. Priced at \$6,250 for a 10M-byte system, the Control/Net is available from the vendor at 707 Nicolet Ave., Winter Park, Fla. 32789.

## Mark XII Modem Unveiled

VAN NUYS, Calif. — Anchor Automation, Inc. recently announced a modem that emulates the command structure of the Hayes Microcomputer Products, Inc. Smartmodem.

The Mark XII modem reportedly can be operated manually through a keyboard without computer coding or automatically to answer and originate calls at 1,200 bit/sec for Bell 212A compatibility and up to 300 bit/sec for Bell 103, according to a company spokesman.

The unit detects dial tone and busy signals, automatically displaying dialing status on the CRT. The spokesman said an on-board complementary metallic oxide semiconductor microcomputer results in low power consumption and a high degree of reliability.

The device uses a standard RS-232C serial interface with built-in cable, comes equipped with two telephone jacks and cord and is directly connected to a wall telephone outlet.

The Mark XII is available for \$399 from Anchor Automation, which is located at 6915 Valjean Ave., Van Nuys, Calif. 91406.

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## Ascii Terminal Features 12-In. Display

SAN FRANCISCO — Liberty Electronics has announced a visual display terminal said to include a high-resolution, nonglare, 12-in. diagonal screen display, user-programmable features and nonvolatile memory.

The Freedom 300 Ascii terminal is said to offer eight foreign character sets, a standard low-profile keyboard, nonembedded character attributes for both visual display and data entry, double-high and double-wide characters and 86 extended graphics characters.

Priced at \$745, the terminal is available from Liberty Electronics at 625 Third St., San Francisco, Calif. 94107.

## DMS-816 Touts Compatibility With IBM Micro

OAKLAND, Calif. — Digital Microsystems, Inc. has announced the availability of a workstation said to be compatible with the IBM Personal Computer.

The DMS-816 workstation allows users to run either IBM's MS-DOS or Digital Research, Inc.'s CP/M operating system on the vendor's Hinet local-area network, a spokesman for Digital Microsystems said.

The DMS-816 reportedly duplicates the functions of IBM's read-only memory for I/O, an IBM-compatible monochrome video display and a keyboard with all the functions of the Personal Computer.

The DMS-816 features an integrated 12-in. video monitor and detachable keyboard, as well as dual microprocessors, 256K bytes of random-access memory, a 19.2K bit/sec RS-232C printer port and a parallel port, according to the spokesman for the firm.

Priced at \$1,695, the DMS-816 is currently available from Digital Microsystems, which is headquartered at 1735 Embarcadero, Oakland, Calif. 94606.

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In fact, Plexus systems cost thousands of dollars less than the minicomputers we outperform.



To get a better idea of just how good that performance is, come get a demonstration. Call 800-528-6050, ext. 1444. In Arizona, 800-352-0458, ext. 1444. Or write Ralph Mele at Plexus Computers, Inc., 2230 Martin Avenue, Santa Clara, CA 95050.

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Message Center/Directory from AT&T Information Systems displays visible proof that you can be out of town, out of the office,

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It will *never* forget you.

It's a personalized call coverage and information system. With it, one trained attendant can act as a backup personal secretary to you and 149 other busy managers.

Calls to unanswered or busy phones are automatically routed to the Message Center attendant. The display lets the attendant know where you are, why you're there, for how long, how you can be reached—or anything else you want to leave as a message.

You can retrieve your messages three

ways: from a display unit, on electronically-printed hard copy, or with a call to the attendant.

The Directory function adds to Message Center. It's an on-line database that gives you continuously updated information about fellow employees. Information such as name, extension number, location, title, department, and up to ten other fields of information.

The result? Vastly improved call coverage, better information flow, no unanswered phone calls, no missed messages, *no more pink slips.*

# T FORGOTTEN

Message Center/Directory is just one of several office management applications available on DIMENSION® 600 and 2000 systems and the new System 85. You can hook up a few individuals or your entire company. It's your choice.

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You can attach any combination of peripheral devices: voice-only terminals, voice terminals with 40-character displays, data terminals with full CRT screens like the 500 BCT pictured above, or new intelligent terminals that combine voice and data functions in an integrated workstation. And there's a full line of printers.

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If your application needs currently find you switching between 3270 and VT100-style terminals to get the job done, Lee Data has a better way.

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## Provides Micro-Supermini Link Plexus Unleashes Back-End Processor

SANTA CLARA, Calif. — Plexus Computers, Inc. has announced a back-end processor, the P/65, which allows users of Plexus and IBM microcomputers to access data stored in Plexus supermini-computers.

In addition, Plexus announced support for a relational data base management system (DBMS), Unify, developed by Unify Corp. The DBMS reportedly gives users access to data bases in multiple Plexus systems using the Unix operating system.

The P/65 acts as a network file server providing up to 1.1G bytes of storage, data base management and multiuser access to shared data. The unit was designed with disk caching hardware and software to store and retrieve shared data on a Xerox Corp. Ethernet local-area network. This, the vendor said, frees individual multiuser systems to perform terminal-oriented and DP functions.

### Three Micros Share Memory

The P/65 consists of three microcomputers, which share from 1M to 4M bytes of memory. The Ethernet interface is accomplished via an intelligent network processor based on an Intel Corp. 8086 16-bit microprocessor with 128K bytes of main memory. This processor manages the network I/O transactions and handles low-level network protocol processing, the vendor said.

Disk caching software is executed by a mass storage processor, a 16-bit Zilog, Inc. Z8000 microprocessor with 128K bytes of memory. The mass storage processor reportedly anticipates those sections of the disk that are likely to be accessed and

stores that data in a buffer memory for retrieval, the vendor said.

All file-service functions are performed by a 32-bit Motorola, Inc. 68000-based file-service processor, which can be equipped with 1M to 4M bytes of main memory. This processor manages the Unix file system and directs the operations of the entire system.

The file-service processor also runs the Unify DBMS and other software packages, according to the vendor.

The P/65 supports up to four 285M-byte, 14-in. rigid Winchester disk drives with streaming 9-track tape backup. Smaller disk drives are also available, the vendor said.

The P/65 costs \$49,950 and operates with Unix System III and the firm's Network Operating System.

In addition to the P/65, Plexus unveiled a Unix network workstation capability, which permits stand-alone IBM Personal Computers to act as single-user, Unix-based microcomputers. The IBM Personal Computers can also serve as nodes on a Unix-based network with access to shared peripherals, data bases and larger Unix-based Plexus processors. The networking capability consists of a software package called Unetix. The package costs \$250, the vendor said.

The Unify DBMS permits multiple users in a Plexus network to gain access to data bases in various systems in the network. Unify is geared to larger data bases and transaction processing applications. Other features include a query function, report writer, host language interface and



The Plexus P/65, P/35 and P/25

transaction logging. Unify costs \$3,000, the vendor said.

Plexus is located at 2230 Martin Ave., Santa Clara, Calif. 95050.

## North Star Offers Multiuser System, Fits IBM Micros

SAN LEANDRO, Calif. — North Star Computers, Inc. has announced the Dimension system, a multiuser microcomputer system that is compatible with IBM's Personal Computer and Personal Computer XT.

The Dimension system can support up to 12 users simultaneously with each user having the capability of running a different Personal Computer or Personal Computer XT application, the vendor said.

The heart of the system is an Intel Corp. 8086 microprocessor and a 13-slot IBM bus. Each user has a dedicated workstation board, which connects to the IBM bus. The Dimension system uses an operating system compatible with IBM's PC-DOS Release 2.0, the vendor said.

The microprocessor used in the workstation is an Intel 8086-2, which reportedly provides each user with the equivalent of a Personal Computer XT microcomputer.

In addition, the Dimension system offers each user access to common peripherals such as fixed disk drives, printers and communications devices, the vendor said.

Standard features of the Dimension system. (Continued on Page 137)

## Western Graphtec Announces Line of X-Y Flatbed Plotters

IRVINE, Calif. — Western Graphtec, Inc., formerly Watanabe Instruments, has announced the WX 4630 series, a line of X-Y Flatbed intelligent plotters.

Using one, two or 10 pens, the plotters are said to be directly compatible with digital control equipment through the use of standard interfaces, such as RS-232C, GPIB (IEEE-488 or 8-bit parallel).

The series features modular mechanical and electrical design, incorporating microprocessors and fully digitized, inner controls. Other features include a pulse pen drive, 42 single-key programmable function commands, an operating speed of 16 in./sec., a 15-in. by 10-in. plotting area, a flatbed and a roll feed with or without a built-in paper cutter. Also, the plotters can

draw circles, curves and arcs, the vendor said.

The WX 4630 series ranges in price from \$3,990 to \$4,990. Western Graphtec is located at 17 Chrysler St., Irvine, Calif. 92714.



WX 4630 Intelligent Plotter

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Data is switched at 64 kbps synchronous and 19.2 kbps asynchronous. The packet-switching capability allows dissimilar terminals to communicate with each other; or with central computers. The Omni allows tandem switching of data circuits, use of various protocols and more efficient use of available bandwidth.

Omni represents GTE's ongoing commitment to providing businesses like yours with the most advanced communications you can find. A commitment backed by over a century of experience.

If Omni looks like the telecommunications system that's tailored for you, write us or call for more information on it at GTE Business Communication Systems Incorporated, P.O. Box 4050, 12502 Sunrise Valley Drive, Reston, VA 22091, 1-800-BCS-2900.

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# Micro-Based Controller Supports DEC Systems

ANAHEIM, Calif. — Computer Storage Technology, Inc. (CST) has announced a microprocessor-based magnetic tape peripheral processor that supports Digital Equipment Corp. Unibus-based computers and can control up to four 9-track tape drives.

The firm also unveiled a streaming tape subsystem for DEC LSI-11 computers that provides up to 85M bytes of backup storage for Winchester disk systems.

The Model TC-200 controller is a single-board processor that can control tape drives operating at speeds ranging from 25 to 125 in./sec. It takes up one slot in the computer's backplane and can be used with 800 bit/in., 1,600 bit/in. and dual-density

tape systems, a spokesman claimed.

The unit features automatic self-test verification and read-after-write error-checking logic to prevent data loss.

## HP Announces 1/2-In. Tape Drive

PALO ALTO, Calif. — Hewlett-Packard Co. has announced the HP 7974A, a 1/2-in. tape drive designed for data backup on mid-range systems with between 100M and 500M bytes of on-line disk storage.

The HP 7974A can operate in either start/stop or streaming modes with a capacity of 1,600 phase-encoded char./in. The drive operates at 50 in./sec with a 200 in./sec backup speed when used in a start/stop

loss. It supports all DEC operating systems that include drivers for RSTS/E, RSX-11M and RT-11 operating systems. The unit can reportedly be installed without adding software

mode. Support for nonreturn to zero inverted (NRZI) 800 char./in. double-density tape formats is also available, the vendor said.

In a streaming mode, the tape drive can operate at 100 in./sec.

The HP 7974A is supported on the HP 3000, HP 1000 and HP 9000 series processors. The disk drive costs \$12,500. The NRZI format option costs \$2,500 from HP, 1830 Embury Road, Palo Alto, Calif. 94303.

drivers or implementing any diagnostic changes, the spokesman added.

The TC-200 costs \$3,000.

The CS-300 tape subsystem incorporates the firm's GC-300 single-board peripheral processor and a 1/2-in. streaming tape drive. The unit also includes a 1/2-in. tape cartridge as the high-capacity storage medium.

The device can be configured with two capacities: the 20M-byte CS-320 and the 45M-byte CS-345, which can be extended to 55M bytes by using an optional cartridge. Data transfer in both configurations can reportedly be sustained at 90K byte/sec with a 97% tape utilization.

The peripheral processor takes up one slot in the LSI-11 backplane, while the tape drive and associated power supply are contained in a single chassis that can be mounted in a standard 19-in. equipment rack.

The device costs \$4,970 from the firm at 1369 S. State College Blvd., Anaheim, Calif. 92806.

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As an added plus for CN '84 attendees... you'll have a chance to win a DEC Rainbow 100+ Computer System. COMMUNICATION NETWORKS '84 will take place at the Washington Convention Center in Washington, D.C., the telecom capital. It will be held on January 31 - February 2, 1984. Call toll-free 800-225-4606 (In MA, 617-476-0700) for more information. Or fill out and return the coupon below.



The DEC Rainbow 100+ The Rainbow 210+ option with printers 200K and 400K microcomputers, a 10 MB Winchester hard disk, dual floppy drives in 5 1/4 and 5 1/8 inch sizes and super-high resolution, built-in colorized monitor, printer port and LAN bus system memory.

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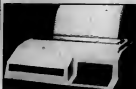
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ISI Model 487

## ISI Model 487 Added to Line Of Printers

ANN ARBOR, Mich. — Interface Systems, Inc. has announced the ISI Model 487, the latest addition to its family of IBM 3270 plug-compatible printers.

The printer is said to incorporate a variety of features into a tabletop design. The Model 487 reportedly delivers near-letter quality or 7- by 9- in. dot matrix printing. It accepts continuous forms and offers a demand document feature. Single-cut letterhead sheets can be fed manually or automatically with the optional sheet and envelope feeder. A control panel provides access to the ISI 487's programmable memory, the vendor said.

The ISI Model 487 comes ready to be plugged into any IBM 3274/3276 system and offers standard coaxial support of IBM's Synchronous Data Link Control Character Strength.

The Model 487 costs \$3,950, according to the vendor. ISI is located at 5455 Interface Drive, Ann Arbor, Mich. 48103.



# LOTUS

# 123

**Lotus 1 2 3 and Dataproducts P Series color printer are the best combination for any business assignment.**

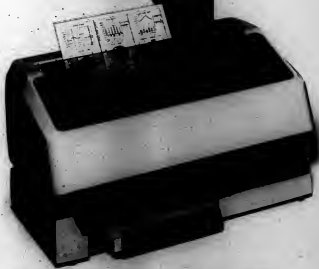
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1 2 3 and Lotus are trademarks of Lotus Development Corporation.

## SMS Micro/TSX-Plus Software-Compatible With DEC PDP-11

NASHVILLE, Tenn. — A multiuser microcomputer system that is software-compatible with Digital Equipment Corp.'s PDP-11 mini-computer has been announced by Scientific Micro Systems, Inc. (SMS).

Called the SMS Micro/TSX-Plus (the computer runs under the firm's TSX-Plus operating system), the machine is built around DEC's LSI-11/23 CPU and can accommodate from three to 16 users. The system includes 15.9M bytes of hard disk storage and can be placed on a desktop, a spokesman said.

The unit includes a memory management facility that is said to speed throughput by allowing many processes to reside simultaneously in up to 4M bytes of main memory. It also has a transparent spooling system that allows users to print files without degrading terminal and program performance.

Other features of the TSX-Plus operating system include system administrative control, shared-file record locking, data and directory caching, program debugging facilities, performance analysis and a system optimization utility.

The system is preconfigured to support three user-supplied DEC VT100 terminals and one serial port operating at 9,600 bit/sec. It can be expanded by upgrading to the firm's full implementation of the operating system, adding four serial ports and 256K-byte memory modules.

## Repair Aid Designed For Unibus

HOUSTON — Information Products Systems, Inc. has announced its Digital Equipment Corp. VAX-11 Unibus maintenance aid said to allow troubleshooting and repair of all Unibus peripherals without interrupting VMS operation.

The Model 700 is plugged into the Unibus path and reportedly allows the user to switch the Unibus string on the output on and off. The switching operation does not generate unsolicited interrupts to the VMS operating system causing errors.

A 14-day free evaluation is offered to credit-approved customers. The Model 700 costs \$995 from Information Products Systems, 6567 Rooklin, Houston, Texas 77074.

The largest TSX-Plus system will support up to 30 concurrent tasks as well as real-time jobs, the firm said.

The SMS Micro/TSX-Plus costs \$11,000 from Scientific Micro Systems at 1027 17th Ave. S., Nashville, Tenn. 37212.

## Hard Disk Subsystem Fits IBM Micro

SANTA ANA, Calif. — A 5¼-in. hard disk subsystem for the IBM Personal Computer has been announced by Zetec Corp. The unit integrates a number of popular business and word processing software packages along with a data storage area.

Called the Business Manager subsystem, the hardware/software device boasts from 10M to 15M

bytes of storage and integrates such software as Micropro International Corp.'s Wordstar, Spellstar and Mailmerge and Datamension Corp.'s Report Manager spreadsheet program and Exec program generator. A relational data base manager and six accounting programs are also included, the vendor said.

All of the software pro-

grams are integrated into a single shell section on the hard disk and can interact with data stored on the main portion of the disk as well as with each other, a spokesman said.

The system costs \$4,500 for the 10M-byte version and \$5,200 for the 15M-byte disk unit.

Zetec is located at Suite 115, 1420 E. Edinger Ave., Santa Ana, Calif. 92705.

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UCS Tapesaver 969 Cartridge Tape System

## Cartridge Tape System Targets Users of IBM Series/1 Minis

DENVILLE, N.J. — A cartridge tape system that allows users of IBM Series/1 minicomputers to store and retrieve data on ¼-in. magnetic tape cartridges was recently announced by Ultimate Computer Services, Inc. (UCS).

The UCS 969 cartridge tape system, named Tapesaver, is available in two

models operating at storage rates of 30 in./sec or 17,500 bytes/sec for the Tapesaver/1, and 60 in./sec or 35,000 bytes/sec for the Tapesaver/2. Retrieval rates are 60 in./sec and 90 in./sec, according to a company spokesman.

The Tapesaver/1 will copy 67M bytes of data on one 600-ft cartridge in one hour, and the Tapesaver/2 will

copy the same amount of data in half the time, the company said.

Each system consists of a cartridge tape drive, controller, power supply and a single-board attachment card that fits into one I/O slot on any Series/1. The units mount into the IBM 4997 rack enclosure.

Each model costs about \$7,000 from UCS, 30 Broad St., Denville, N.J. 07834.

## Andromeda Introduces Micro

CANOGA PARK, Calif. — Andromeda Systems, Inc. has announced a transportable computer system based on Digital Equipment Corp.'s LSI-11 processor and Q-bus.

Called the 11/M12, the unit features an LSI-11/23 processor, 256K bytes of random-access memory, 10M bytes of fixed Winchester disk storage, 512K bytes of floppy disk storage and four serial ports.

The unit runs standard DEC software including the RT-11, TSX-Plus and RSX-11M operating systems, the vendor said.

When used with a standard CRT terminal, the unit can be used as an intelligent workstation.

The 11/M12 costs \$8,400 from Andromeda Systems, 9000 Eton Ave., Canoga Park, Calif. 91304.

## ADC Unit Translates Disk Media

TUSTIN, Calif. — Applied Data Communications, Inc. (ADC) has announced a universal diskette reader/writer. The unit is said to be a media translation system that accepts source computer data from a floppy disk of any size, density and format.

The Model TM-500 reportedly resolves physical and logical incompatibilities among floppy disk formats enabling computers to interchange Digital Research, Inc. CP/M files, text and data bases.

A standard X-on/X-off feature reportedly allows the TM-500 to accept real-time data communications input.

IBM's Binary Synchronous Communications protocol is optional at \$1,600. In its basic configuration, the TM-500 system is priced at \$15,800 from ADC, 14272 Chambers Road, Tustin, Calif. 92660.

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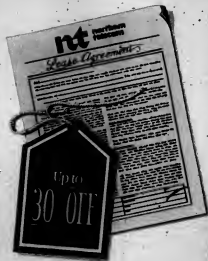
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For more on the Prime 9950, or on the entire Prime family of compatible computers, call **1-800-343-2540** (Mass., 1-800-322-2450), or write Prime Computer, Prime Park, MS 15-60, Natick, MA 01760. In Canada call 416-678-7331. In Europe write, One Lampton Road, Hounslow Center, Hounslow, Middlesex, TW3 1JB, England. In the Far East, write Unit 1005, Tannery Block, 35 Tannery Road, Singapore 1334.

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## System Provides Services To Micros Under CP/M

FAIRFIELD, N.J. — Personal Computer Gateway, Inc. recently announced a hardware and software system that provides communications capability, file handling and storage service to microcomputers operating under Digital Research, Inc.'s CP/M operating system.

Called the Data Pouch, the unit includes an 80M-byte hard disk drive, eight I/O ports and software.

The product connects to several popular microcomputers through RS-232C ports. The Data Pouch provides file storage and file transfer among connected microcomputers as well as electronic mail, a bulletin board and private and shared user

files. Other features include security sign-on and menu commands.

The product reportedly provides facilities for registering up to 31 users. It will support a mix of eight to 16 simultaneous users depending on the transmission rate. The product supports transmission speeds up to 9,600 bit/sec over dedicated lines and up to 1,200 bit/sec over direct-dial lines. It is available for IBM Personal Computers and compatible products: Apple Computer, Inc.'s Apple II and III; and other micros operating under CP/M.

The package costs about \$19,000 from Personal Computer Gateway, 22 Daniel Road, Fairfield, N.J. 07006.

## Sony Bundles SMC-70 Models

PARK RIDGE, N.J. — Sony Corp.'s Information Products Division has announced the availability of four bundled versions of its SMC-70 microcomputer system. Each one includes Digital Research, Inc.'s CP/M operating system and a variety of vertically targeted software programs.

At the same time, Sony announced price reductions in the components that make up the SMC-70 microcomputer.

The bundled systems, each equipped with dual 280K-byte, 3½-in. floppy disk drives, include:

- The Generalist, consisting of a 12-in. Sony monitor, dot matrix printer, word processing and spreadsheet software and all cables and wiring. It costs \$3,451.

- The Artist's Easel, including a 12-in. color monitor, Sony Draw Basic and Graphics Editor software, costs \$2,691.

- The Manager includes a color monitor, spreadsheet software and Sony's Record Management package for small businesses or department-level managers. This is an expandable system for business modeling applications and costs \$3,036.

- The Bookkeeper consists of the color monitor; dot matrix printer; 64K-byte Corvus Systems, Inc. hard disk system with interface; and accounts payable, receivable and general ledger software. This system, priced at \$6,700, was designed to handle large amounts of data.

Peripherals for each of the systems include a 5¼-in. hard disk system and 256K bytes of cache memory. Each system includes 13 resident I/O interfaces as standard equipment, including a Centronics Data Computer Corp.-type parallel port, an RS-232C serial interface and a red-green-blue video port. The basic units also have a battery back-up clock/calendar, system test diagnostics and a time generator, a spokesman said.

Price reductions on SMC-70 components include mark-downs on some peripherals, including the 64K-byte keyboard/CPU console, which will be discounted by \$480, Sony announced.

Sony is headquartered at Sony Drive, Park Ridge, N.J. 07656.

## CAD System Out, Based On DG Series

FAIRFIELD, Conn. — Summagraphics Corp. has introduced Icon, a computer-aided design (CAD) system based on Data General Corp.'s new Desktop Generation series computer.

The CAD system was designed for applications in the architectural, engineering, construction and printed-circuit board marketplaces.

Icon features full performance capabilities and all software necessary to create, preview, edit, store and recall graphics in a professional workstation.

It offers a self-contained, ergonomically designed workstation available in single- and dual-user configurations. Each workstation has an integral digitizer with an easy-to-use menu and two tilt and swivel monitors, a spokesman said.

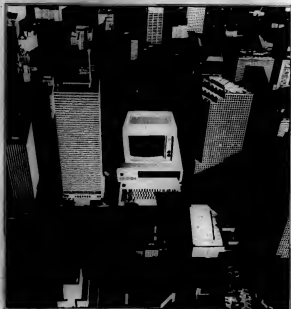
The new system features a 19-in. raster graphics display with instructions and built-in Help tables detailing the steps required for any operation.

Complete application packages for AEC and PCB professionals are available. The packages include programs for architecture, civil engineering, surveying, cost estimating, printed-circuit design, mechanical and electrical design and word processing.

A per-workstation price of \$37,250 is based on a four-workstation configuration.

More information is available from Summagraphics through 35 Brentwood Ave., P.O. Box 781, Fairfield, Conn. 06430.

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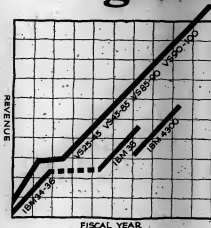
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## Hard Disk Drive Line Also Announced

# Disk Cache System Targets IBM Micro Users

SAN JOSE, Calif. — Santa Clara Systems, Inc. (SCS) has introduced a disk cache system and a line of internal hard disk drives for IBM Personal Computer users. In addition, SCS is offering upgrades of its high-capacity, external 5¼-in. hard disk drives.

Quick Disk, the disk cache system, is said to be an exter-

nal add-on memory device that contains random-access memory ranging from 128K bytes to 1M byte and dynamic error correction.

Attached to an IBM Personal Computer, the product is said to increase the speed and performance of SCS' PCnet network and to speed up hard disk drives. The five models of Quick Disk range

in price from \$2,795 for 128K bytes to \$8,595 for 1M byte, the vendor said.

The newly announced family of internal disk drives was designed for use with the IBM Personal Computer or Personal Computer XT. Offered in three configurations and in kit form, the 3½-in. drives fit into one of the Personal Computer's floppy

disk enclosures. The line of products ranges in price from \$2,095 to \$2,995, the vendor said.

The upgraded 5¼-in. hard disk drives reportedly give users 20% more storage capacity and about a 25% increase in I/O throughput for the same price. The upgraded versions feature 6M, 12M or 18M bytes of fixed disk

storage, with 6M bytes of storage on a removable 3½-in. cartridge.

The prices range from \$2,295 to \$5,050 from SCS, 1860 Hartog Drive, San Jose, Calif. 95131.

## Sanyo Micro Competes With IBM

MOONACHIE, N.J. — Sanyo Business Systems Corp. has unveiled the MBC 550 series, a 16-bit microcomputer that reportedly will run about 80% of the off-the-shelf programs for the IBM Personal Computer. The system differs from the Personal Computer in that it does not address memory in the same location and offers eight colors to IBM's four, a spokesman said.

The MBC 550 series includes a detachable keyboard and 128K bytes of random-access memory that is expandable to 256K bytes. In addition, the unit features a standard parallel printer port, optional serial port, dual disk drive, speaker and joystick ports, the spokesman said.

The MBC 550 comes with Information Unlimited Software, Inc.'s Easywriter I, Micro International Corp.'s Wordstar and Calamus, Sanyo's Basic and Microsoft, Inc.'s MS-DOS.

It costs \$999. Sanyo is located at 51 Joseph St., Moonachie, N.J. 07074.

## Omni Line Beefed Up

SAN DIEGO — Digital Computer Corp. has added two models to its Omni line of multiuser microcomputers.

Called the Series 2000 and 4000, the models use Digital Research, Inc.'s CP/M or Software 2000, Inc.'s Turbo DOS operating systems. The Series 2000 has single or dual hard disk configurations and offers up to 106M bytes of disk storage.

Up to 10 users can operate the Series 2000, according to the vendor.

The Series 4000 can operate with two or four hard disk drives, offering up to 212M bytes of storage. The Series 4000 supports up to 32 users.

The Series 2000 costs from \$6,395. The Series 4000 costs from \$17,995.

Digital Computer is located at 7430 Trade St., San Diego, Calif. 92121.



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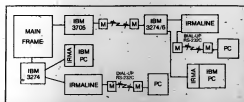
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## Sunol's Mass Storage System Boosted With 5¼-In. Disk

PLEASANTON, Calif. — Sunol System Co. has upgraded its microcomputer Mass Storage System with a 5¼-in., 51M-byte Winchester disk drive system.

Host adapters are available for IBM, Texas Instruments, Inc.; Apple Computer, Inc.; Radio Shack; and other microcomputers.

The half-size Winchester features built-in error-correction code, run length limited magnetic tape-coding format and a proprietary controller design. Those features reportedly enable Sunol Systems to provide up to 60% more usable storage and allow informa-

tion transfer rates to climb from 5M bit/sec to 7.5M bit/sec. Users reportedly can double their storage by using two of these half-size drives in place of a 5¼-in. drive.

Up to 64 users and up to seven different operating systems can share a single Mass Storage Unit.

The Mass Storage Disk costs \$4,595 and will be available in December. On-line backup storage (32M-byte capacity) is available via a ¼-in. tape cartridge that lists for \$1,295 from Sunol Systems through P.O. Box 1777, 1072 Serpentine Lane, Pleasanton, Calif. 94566.

## Disk Controller Designed To Optimize Unix Systems

DALLAS — A hard disk controller said to be designed to optimize the Unix operating system and Unix-based systems was recently announced by Interphase Corp.

The company's 5MD 2190 features cache memory and an intelligent caching system whereby the controller predicts what data will be accessed next and caches it in the controller memory for immediate availability to the operating system, a spokesman said. A selected override capability allows reading on a non-cached basis.

The unit reportedly formats disks in programmable groups of contiguous sectors. It also features a direct

mode that bypasses the controller's on-board buffering and provides direct connection between the bus and the disk, the spokesman said.

The SMD 2190 supports many popular microcomputers and disk drives, the company said. Single-unit purchase price is \$2,250. Additional information is available from Interphase, 2925 Merrell Road, Dallas, Texas 75229.

## Kaypro Micros Receive Adapter, Cable

ORANGE, Calif. — Advent Products, Inc. has announced an External Monitor Adapter (EMA) and a 12-ft keyboard cable for Kaypro, Inc.'s Kaypro II and 4 microcomputers.

The EMA reportedly provides the ability for the Kaypro II or 4 to drive an external video monitor. Installation does not alter or damage the motherboard, and no soldering, desoldering or wiring is required. It costs \$59.95, the vendor said.

Using the same type and quality of cable, the 12-ft keyboard cable is said to be a direct replacement for the original 6-ft cable and works with the Kaypro II, 4 or 10. It costs \$12.95. Advent Products is located at 965 N. Main St., Orange, Calif. 92667.

## Comrex Christens Multicolor Plotter

TORRANCE, Calif. — Comrex International, Inc. has introduced a plotter for users of the IBM Personal Computer, Epson America, Inc. QX-10, Apple Computer, Inc. computers and other microcomputers.

The Model CR-1810 Comscriber I plotter can produce charts, graphs and illustrations in several colors. The plotter uses paper 8½-in. wide by 1-in. to 10-ft long. The basic plotting area of 8½-in. by 11-in. can be extended up to 120 in. in length. Characters ranging in height from an ¼-in. to 20-in. high can be drawn. The plotter measures 2.9-in. by 14.3-

in. by 8.8-in., the vendor said.

Using a pen, the plotter reportedly can operate at up to 6 in./sec. and line segments are accurate to one four-thousandth of an inch.

## Drives Target Honeywell DPS 6

CHICAGO — Knaus Systems, Inc. has announced its Parrot Winchester disk drives that operate on Honeywell, Inc.'s DPS 6 processors.

The drives offer a maximum storage capacity of 315M bytes and are compatible with Honeywell's MSU 9604 256M-byte drives. The drives

are rack-mountable with interchangeable parts. An automatic lock protects read/write heads by locking the heads and disk platters when power is switched off.

The Parrot drives cost \$15,990. Knaus Systems said from 9950 W. Lawrence Ave., Chicago, Ill. 60676.

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## Nuvec Laboratories Unveils Decentralized Micro Systems

LEXINGTON, Mass. — A family of supermicro and personal computer systems with decentralized hardware and software has been introduced by Nuvec Laboratories, Inc.

Nuvec Muxex I and Muxex II supermicros feature dedicated processor buses and decentralized multiprocessors that share a

common system bus to provide 6.3M bytes of random-access memory (RAM) for up to 32 users. Running on decentralized software, the micro includes standard Unix programmer interfaces and built-in data base management systems.

The Muxex I system includes a 157M-byte Winchester disk, while the Muxex II combines a 315M-byte disk with a 16-channel, 1,200 bit/sec full-duplex modem for a total network capacity of 4,024 users. Muxex II is expandable to 17,000M bytes.

Running under IBM Personal Computer software or Digital Research, Inc.'s CP/M 86, the Nuvec personal computer features up to four quad-density, double-sided 5 $\frac{1}{4}$ -inch diskettes or hard disks and up to 983K bytes of RAM.

The Nuvec Muxex systems start at \$25,000 and the personal computer at \$18,000, with the price depending on configuration and options. Nuvec Laboratories is located at 429 Marrett Road, Lexington, Mass. 02173.

## Power System To Distribute AC Power

SAN DIEGO — Topaz, Inc. recently announced a power distribution system series for distributing noise-free ac power to computers and peripherals.

The Topaz Maximum Value Powercenter (MVP) distributes ac power throughout a computer room via flexible, watertight-shielded cables that allow users to rearrange equipment without the inconvenience associated with fixed-wire installations, a spokesman said.

The MVP reportedly provides up to 126 pole positions and will accommodate up to 73 cables. Each system is equipped with an internal isolation transformer and includes a digital power management panel for system status monitoring, computer-grade grounding, a building interface package for creating centralized air-conditioning/fire alarm control and main circuit breakers for each output load center.

The system is said to be 97% power efficient and is available in power ratings of 100 kVA, 125 kVA and 150 kVA, starting at \$12,000. Topaz can be reached at 9192 Topaz Way, San Diego, Calif. 92123.

## Disk Extends Micro's Storage

PRINCETON, N.J. — Floppy Disk Services, Inc. has announced the FD-PC8, which the company said is an 8-in., double-sided disk drive that adds 2.5M bytes of on-line storage capability to the IBM Personal Computer.

The FD-PC8 is said to be one-half the height of standard disk drives and offers IBM mainframe interface capabilities, the vendor said.

The unit is available in both single and dual system configurations for \$1,095 and \$1,495 respectively from Floppy Disk Services, 741 Alexander Road, Princeton, N.J. 08540.

## Workstation With Logic Unit Completes Idea 1000 System

PORTLAND, Ore. — Mentor Graphics Corp. recently announced a workstation that incorporates a logic analysis system into its Idea 1000 computer-aided engineering system.

The company said the Midas 7000 completes the automation of digital hardware design by bringing hardware verification and test to the existing capabilities of schematic entry/capture, design simulation and physical layout.

The logic analysis system is controlled through the Idea 1000 workstation's graphics-oriented user interface that controls other system tools, and the unit features an expandable architecture that will accommodate other digital test instrumentation, a company spokesman said.

The Midas 7000 takes real-time "snapshots" of the digital activity taking place inside a computer-based product as it executes software, providing two types of information: a record of the logic states produced by the software/hardware interaction, and a record of the timing relation-

ships between the various digital control lines.

The logic analysis system is priced at \$14,900 and will be available for shipment in the first quarter of 1984, according to Mentor Graphics. Additional information is available from Mentor Graphics, 10000 S.W. Nimbus Ave., G7, Portland, Ore. 97223.

## Timex Offers Color Micro

WATERBURY, Conn. — Timex Computer Corp. has announced the 2068 color microcomputer.

The unit features 72K bytes of internal storage divided into 48K bytes of random-access memory and 24K bytes of read-only memory. The unit can be used for word processing, entertainment and educational applications, the vendor said.

The 2068 costs \$199.95. Timex Computer said through P.O. Box 2126, Waterbury, Conn. 06720.

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## TUTORIALS

TUESDAY, JAN. 17

ALL-DAY SESSIONS - 9:30 a.m. to 5 p.m.

- ① Software Contracts & Licenses  
Speaker: Susan H. Nye, of Genston, Snow, Ely Bartlett; Palo Alto, CA
- ② C Style and Portability  
Speaker: Eric Allman, of Britton-Lee; Los Gatos, CA
- ③ UNIX Systems Administration  
Speakers: Ed Gould and Bob Kridle, of Mt. Xinu; Berkeley, CA
- ④ Advanced Shell Programming  
Speaker: Steve Bourne, of Silicon Graphics Inc.; Mountain View, CA
- ⑤ VI Editor
- ⑥ UNIX Systems on Local Area Networks

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## /usr/group SESSIONS

## USENIX SESSIONS

WEDNESDAY, JAN. 18

- ⑦ Keynote Address - 9 a.m.-10 a.m.
- ⑧ Fifth Generation Computer - 1:30-3 p.m.
- ⑨ UNIX Market Research - 3:30-5 p.m.
- ⑩ Joint Session - 10:30 a.m. to Noon
- ⑪ Networking - 1:30-3 p.m.
- ⑫ Distributed Processing Under UNIX - 3:30-5 p.m.

THURSDAY, JAN. 19

- ⑬ UNIX Micro to Mainframe Communications - 9:30-10 a.m.
- ⑭ UNIX Graphic Work Stations and Applications - 10:30 Noon
- ⑮ Standards for UNIX & C - 1:30-3 p.m.
- ⑯ UNIX and Entertainment - 3:30-5 p.m.
- ⑰ Compilers and Languages - 8:30-10 a.m.
- ⑱ Programming Tools - 10:30 Noon
- ⑲ Novel Applications - 1:30-3 p.m.
- ⑳ Implementations - 3:30-5 p.m.

FRIDAY, JAN. 20

- ⑳ Office Automation Case Studies And New Products Using UNIX - 8:30-10 a.m.
- ㉑ UNIX Microports and Western Electric - 10:30 Noon
- ㉒ Ade and UNIX - 1:30-3 p.m.
- ㉓ Database Systems - 8:30-10 a.m.
- ㉔ Graphics - 10:30 Noon
- ㉕ Open Session - 1:30-3 p.m.
- ㉖ Joint Session - 3:30-5 p.m.

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**B** SELECT SESSIONS YOU WISH TO ATTEND:

All Day Tutorials	Conference Program - Please circle sessions you wish to attend to help us in planning adequate seating.		
TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1 2 3	4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	23 24 25 26 27	

① Keynote session begins at 9 a.m.

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## North Star's Dimension Works With IBM Micros

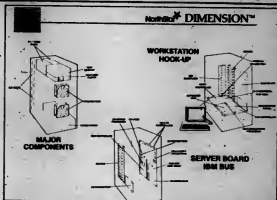
(Continued from Page 117)  
tem include one 360K-byte floppy disk drive and one 15M- or 30M-byte fixed disk drive. Add-in spaces for a second fixed disk drive and an integrated tape backup subsystem are also included, the vendor said.

The main processor board is equipped with 256K bytes of random-access memory (RAM), which is expandable to 512K bytes. This memory is used primarily as cache memory to speed up the interaction between the user and the hard disk drive. In addition, each workstation board includes 128K bytes of RAM, which is also expandable to 512K bytes. The workstations also come with a local RS-232 interface to connect a local printer or mouse device, according to the vendor.

A two-workstation system, including the CPU, 256K bytes of RAM, a 360K-byte floppy disk drive and a

15M-byte hard disk, costs \$7,000. The same configuration with a 30M-byte hard disk costs \$8,000. Each workstation module costs \$1,500. A 15M-byte add-in hard disk drive costs \$2,000, and a 30M-byte hard disk costs \$3,000. The tape backup add-in module costs \$3,000. Expansion memory boards for the workstation and central module range from \$300 for a 128K-byte board to \$700 for a 384K-byte expansion, the vendor said.

The Dimension system will be available in the first quarter of 1984. More information is available from the vendor at 14440 Catalina St., San Leandro, Calif. 94577.



North Star Computers, Inc. Dimension

## DEC Falcon Gets Cmos Expander From Infosphere

PORTLAND, Ore. — Infosphere, Inc. has announced the FMX-11 complementary metallic oxide semiconductor (Cmos) memory expander for the Digital Equipment Corp. Falcon single-board computer.

The company said the FMX-11 will extend the Falcon's on-board memory capacity to 60K bytes, add battery support for Cmos static random-access memory and provide a Cmos calendar clock and power failure detection logic with battery-back-up. The product will allow users to develop and execute real-time applications in process control, data acquisition and energy management.

According to a vendor spokesman, the FMX-11 supplies address, data and control signals at on-board, memory-cycle speeds, and it retains data during a power failure. The unit's programmable read-only memory address decoder allows the system integrator to link any combination of 2K, 4K- and 8K-byte memory chips for a total of 60K bytes. It is a dual-width, Q-bus board in two versions, one that supports the company's Sphere application development software and another that supports DEC development software.

The single-unit price is \$700 from Infosphere, 4730 S.W. Macadam Ave., Portland, Ore. 97201.



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# Computer-Aided Design System Supports Apple

NEWTOWN, Pa. — Chesell-Robocom Corp. has introduced the Robographics CAD-1, a computer-aided design system.

The new package connects to the Apple Computer, Inc.

Apple II or Apple IIe micro and produces scaled, technical drawings and custom graphics. Designers, illustrators, educators and other business professionals can use the system to create

building plans, mechanical drawings, schematics, flowcharts and business graphics.

The CAD-1 system works with standard, off-the-shelf Apple computers. A complete hardware/software

configuration, including plotter, is available at a starting price of \$4,920.

The system uses a handheld controller to draw lines, circles, arcs and tangents to exact dimensions. Once completed, commonly used symbols and finished drawings are stored on library diskettes and are displayed in miniature for easy recognition and reuse through a graphics index system, the

vendor said.

Two Robographics drafting plotters are available to produce drawings up to 22 by 34 in.

The price of the CAD-1 software, controller and user manual is \$1,095. The product line is currently available through Apple Computer dealers or directly through the vendor, located at Suite 28, 125 Pleasant Run, Newtown, Pa. 18940.

## Price Cut on Tape Backup System

SUNNYVALE, Calif. — Davong Systems, Inc.'s tape backup subsystem, which safeguards data from any Winchester or floppy disk drive used with IBM Personal Computer or Personal Computer XT microcomputers, has been reduced to \$1,275, including interface.

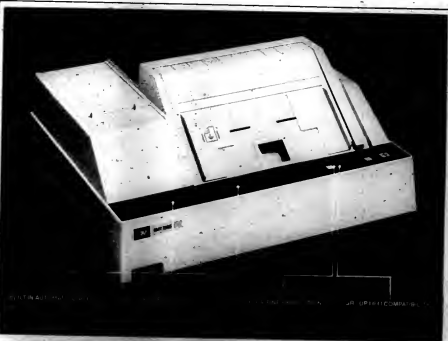
The stand-alone streaming tape drive uses a ¼-in. tape cartridge with a formatted capacity of approximately 18M bytes. An adapter for the backup plugs directly into an IBM Personal Computer or Personal Computer XT expansion slot.

Software capabilities include initial checkout, copying from floppy or hard disk to tape and restoring files from tape to hard or floppy disk. It also can compare file dates so that the most current file with the same title is restored, the company said. Files may be restored to a different volume, and an index lists names and dates of all backup files.

Using the Davong Multi-OS control system, backup can be done by volume or by individual file. A 15M-byte disk can be copied in about four minutes, the company said, and there are four error-

checking methods. More information about the tape backup system can

be obtained from Davong at 217 Humboldt Circle, Sunnyvale, Calif. 94086.



## SBE, Inc. Upgrades Disk Drive

EMERYVILLE, Calif. — SBE, Inc. has announced a Motorola Corp. 68000-based hard disk drive, the SBE 200, which includes a 5¼-in. Quantum 40M-byte Winchester disk drive. The new system is an upgrade from the standard SBE 200, which includes a 10M-byte Winchester disk drive and a 5¼-in. floppy disk.

The Quantum hard disk drive has a capacity of 42.6M bytes of unformatted data or 36.8M bytes of formatted data. Its average access time is 45 msec. Other features of the Quantum drive include a proprietary embedded wedge servo, a rotary voice coil, industry standard interface and a standard mini-floppy-form factor.

The price of the SBE 200 with the 40M-byte Quantum drive is \$6,000 from SBE at 4700 San Pablo Ave., Emeryville, Calif. 94608.

## INTRODUCING 3M's EMT 9165:

The first in a new series of modular facsimile terminals for the 1980s and beyond.

When you equip your central and branch offices with EMT 9165 digital facsimile transceivers from 3M, you aren't just getting easy-to-use fax machines that will work with all of your present Group 1, II, and III equipment. You're also getting an automated facsimile network that can slash your long-distance transmission costs dramatically through their advanced productivity-enhancing features. The EMT 9165's dual polling mode is a good example. It lets you do either of two things: (1) poll other Group III machines in the usual way or (2) send traffic to and obtain documents from

other EMT 9165s with a single call to each machine, so that you eliminate the added expense of double phone calls.

3M's EMT 9165 also helps to provide a detailed audit trail through two types of status reports, including one that supplies a department or personal ID number for each call.

Other major features include: Automatic time and date stamping of incoming and outgoing traffic. Alphamatic display for prompting casual operators and to help in programming the machine for "one-button" operation. Two-digit ID numbers as pass-

words, if required.

**Special Applications:** Modular design. 3M's computer store-and-forward system that interfaces with data networks and supporting protocols such as SNA, HDLC and X.25.

For details on the new EMT 9165 and the full line of 3M electronic message terminals, call 1-800-328-1684 toll-free (in Minnesota, 1-800-752-1072) or in Canada, call 1-800-369-9555. Operator 11. Or mail the coupon to: 3M Business Communication Products Division, 3M Center, Building 216-2N, P.O. Box 33600, St. Paul, MN 55144.

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# Holmes' Portable Drive Fits TRS-80 Model 100

SALT LAKE CITY, Utah—Holmes Engineering, Inc. has introduced the PMD-100 portable micro drive for the Radio Shack TRS-80 Model 100 portable computer.

The PMD-100 allows the Model 100 to save and load programs and files at high speeds using miniature continuous-loop tape cartridges.

The portable micro drive is a battery-operated system

which is reportedly a natural companion to the Model 100 computer. Rechargeable batteries allow several hours of portable operation. The PMD-100 fits with the Model 100 into a standard briefcase.

The drive is attached to the Model 100 RS-232C connector via a coiled telephone cord. The operating system is then downloaded to the Model 100, using the built-in

Telcom software in the Model 100. The operating system then resides in the Model 100's nonvolatile memory.

The operating system provides a menu for the operator's convenience. A program or file may be saved to the tape or loaded from the tape into the Model 100 by single key commands executed from the menu.

Operation of the drive is

similar to operation of a floppy disk. The operator first inserts a tape cartridge into the micro drive. Files may then be saved or loaded, a spokesman explained.

A directory of all files on a cartridge may be displayed on the Model 100's screen. A file may be deleted from anywhere on a tape, and another file may be put in its place.

The PMD-100 operates at 9,600 bit/sec, and a 16K-byte random-access memory buffer in the PMD-100 makes file

transfers fast and efficient, the company claimed.

The portable micro drive retails for \$349.95. Included with the package are five starter tapes, a battery charger, a cable to connect the drive to the Model 100 and operating instructions. A cable to allow the Model 100 to operate from the battery in the PMD-100 is also included.

More information is available from Holmes at 5175 Green Pine Drive, Salt Lake City, Utah 84107.

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## Imaging System Aids Designers, Engineers

MOUNTAIN VIEW, Calif.—Silicon Graphics, Inc. has introduced the Integrated Raster Imaging System (IRIS) workstation, which allows designers and engineers to manipulate two- and three-dimensional designs. The

unit can be used in a stand-alone environment or in multiterminal networks.

The workstation was designed for advanced design and engineering applications among the mechanical sector, including: automobile, aircraft, machine tool, mining and farm equipment industries, electronic systems and components, architecture, engineering and construction, scientific, animation, film and graphics, a spokesman said.

Some product applications include: complex three-dimensional wire-frame and shaded-solids modeling, engineering analysis and simulation, geophysical modeling, printed and integrated circuit layout, schematic capture, animation and medical imaging applications.

The price for a stand-alone workstation is \$59,500, and the price of a terminal is \$37,500, the spokesman for the vendor said.

Further information is available from Silicon Graphics, which is located at 630 Clyde St., Mountain View, Calif. 94043.

## Card for Apple III Allows Extra Devices

CUPERTINO, Calif.—Apple Computer, Inc. has announced the Apple Serial Card III.

According to the vendor, the Serial Card III is for Apple III users who require more than one serial communications device.

By inserting the card into one of the Apple III internal slots, a user can communicate with a variety of modems, plotters, printers and other serial RS-232C communications devices without disconnecting or reattaching any of the system's cables.

Depending on the user's communications, require-

ments, up to four cards can be used at once. The card enables users to perform multiple communications tasks, such as printing documents, while simultaneously communicating with another computer via modem.

If a user requires only one serial communications device, it can be connected directly to the built-in serial port on the Apple III's back panel.

The Apple Serial Card III is available now at a price of \$225. More information is available from the vendor at 10260 Bandley Drive, Cupertino, Calif. 95014.



**What happens in the computer industry in 1984 will profoundly affect the way you do business. This January 2nd Computerworld is going to give you a very educated guess on how it will all fall out.**

Computerworld's annual review and forecast issue will examine some of the major events of 1983 and put them in perspective. But this year the stronger emphasis is on what's going to happen in 1984:

- The January 1 divestiture of AT&T. What will the impact really be?
- When is the shakeout going to come in the Micro market? Who will be the big players be and who'll be dropping out?
- The results of the Computerworld DP Budget Survey: Where is the DP/MIS exec's money going to go? Why?
- Technology. Just what are the R&D people actually working on?

Last year's software announcements and/or agreements will be looked at in light of

which will come to reality in 1984. You'll get a close look at control, security and training issues and how they'll impact DP/MIS managers who spent 1983 off-loading applications to end-users and providing them with computing power.

The entire editorial staff of Computerworld is working full time to review the key events of 1983 and how they'll affect your business in 1984. So you'll get all the insight you need to do your strategic planning for the year ahead.

If you've got product or service ads that will help our readers make informed choices for 1984 — then you need to get color ads to us by December 9th and black and white ads to us by December 15th.

To reserve space in the combined December 26th/January 2nd special issue, call one of the sales offices listed below, or call Don Fagan, Vice President Sales/Marketing; Ed Marecki, National Sales Director or Kathy Doyle, Marketing Support Manager.



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## Targets Micros Multimode Matrix Printer Unveiled

CHARLOTTE, N.C. — Datasouth Computer Corp. has unveiled the D5220, a multimode matrix printer for most popular microcomputers.

The unit provides correspondence-quality, as well as word processing and draft-quality printing, the vendor said.

In a correspondence mode, the D5220 generates an 18- by 48-dot matrix and can print at up to 40 char./sec. For print-intensive applications, the D5220 can operate at up to 220 char./sec. with a maximum throughput of 450 line/sec. In this mode, the unit prints on a 9- by 7-dot matrix and offers a selection of pitches, ranging from 10 to 16 char./in. The

unit can also operate in an expanded print mode, producing between 5 and 8 char./in., the vendor said.

The D5220 features 50 programmable features including forms con-

## Touch-Sensitive Screen Fits IBM

ALBUQUERQUE, N.M. — Computer Technology Associates (CTA) recently announced a touch-sensitive screen and interface for IBM Personal Computer monitors.

The IBM-compatible Soft-Touch utilizes infrared emitter-sensor array technology and is accessed directly through the IBM Personal Computer Basic compiler without extra assem-

ble language routines, according to a CTA spokesman, with the Basic program reading the X and Y coordinates of the moving command.

The screen provides a resolution of 96 horizontal by 64 vertical pixel points, the spokesman said.

Available in January, Soft-Touch costs \$695 from CTA, 1704 Moon N.E., Albuquerque, N.M. 87112.

tro, print mode and communications.

The printer costs \$1,995, Datasouth said from 4216 Stuart Andrew Blvd., Charlotte, N.C. 28210.

Available in January, Soft-Touch costs \$695 from CTA, 1704 Moon N.E., Albuquerque, N.M. 87112.

## Keyboards Out For Radio Shack, IBM Micros

SPOKANE, Wash. — Key Tronic Corp. has announced a version of its enhanced plug-compatible IBM Personal Computer keyboard that offers the Dvorak key layout. Also announced was a replacement full-travel keyboard for Radio Shack's TRS-80 Color Computer.

The Model KB-5150D reportedly is directly plug-compatible with either the IBM Personal Computer or Personal Computer XT and offers additional features such as familiar placement of the Shift and Return keys, an Enter key next to the numeric pad and indicators on the locking mode keys. The KB-5150D has a suggested price of \$269.

The model's Dvorak layout, named after its inventor, August Dvorak, was recently endorsed by the American National Standards Institute. The home row of the Dvorak keyboard reportedly can configure 3,000 word combinations as compared to the standard Qwerty keyboard's 100.

The Model KB-500 keyboard for the TRS-80 was designed to upgrade the functional efficiency and capabilities of the microcomputer. It is said to provide a 15% to 20% higher data input rate. Other features include a user-programmable function key, complete legend description, familiar typewriter layout and full sculptured keypad array with low profile keys. Suggested retail price for the Model KB-500 is \$89.95.

Key Tronic can be reached through P.O. Box 14667, Spokane, Wash. 99214.

## PC11 Boasts Compatibility With PDP-11

HOUSTON — Abacus Technology Systems, Inc. has announced a Digital Equipment Corp. PDP-11-compatible peripheral computer for S-100 bus-based computer systems.

The PC11 reportedly allows users to run PDP-11 software on Digital Research, Inc.'s CP/M-based microcomputers. It includes the DEC RT-11 operating system and CP/M interface software. It also offers the PDP-11 user a method of adding additional systems based on some of the inexpensive, S-100 systems currently available.

The PC11 is a T11 microprocessor-based unit with 64K bytes of on-board memory. The unit plugs into existing S-100-based computers and utilizes the existing processors and peripherals for I/O. The use of 8-in. soft-sectored disks will allow media compatibility with DEC PDP-11 series minis for program interchange, the vendor said.

The package includes the RT-11 operating system, CP/M-based I/O interface program source supplied on 8-in. floppy disks and supports console, printer and dual disk drives, the vendor said. The PC11 introductory price is \$795.

Abacus is located at 8343 Carvel, Houston, Texas 77036.



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## Available From Computer Ideas

## HP 3000 On-Site Courses Launched

CHICAGO — Computer Ideas Ltd. has announced a series of on-site operational training courses for Hewlett-Packard Co.'s HP 3000 superminicomputer.

## Source 2 UPS Introduced By Topaz

SAN DIEGO — Topaz, Inc. has introduced the Source 2 uninterruptible power supply (UPS). The unit was designed for protecting word processors, point-of-sale terminals and other small computer-based equipment against power outages.

The Source 2 provides up to 60 minutes of steady ac power to enable critical equipment to continue operating, even during blackouts. Source 2 output is a sine wave that exactly matches the wave shape of commercial power. This makes the units suitable for use with virtually any type of system, the vendor said.

Each Source 2 UPS consists of a battery, a battery charger, a sine wave inverter, a power monitor and a high-speed transfer switch. When commercial power is present, the Source 2 system filters the power, providing protection against electrical noise and voltage spikes, according to the vendor.

If primary power is lost or if voltage drops more than 15% below nominal, the Source 2 automatically begins supplying ac power from energy stored in its battery, according to the vendor.

The transfer from primary power to battery power occurs in approximately four msec, so the protected equipment experiences no discontinuity of power. When commercial power is restored, the protected equipment is automatically switched back to the power line, and the UPS begins recharging its battery, according to the vendor.

Source 2 is available in power ratings of 200VA and 400VA in 50Hz and 60Hz models. Prices start at \$800, the vendor said.

More information is available from Topaz at 9192 Topaz Way, San Diego, Calif. 92123.



Courses available include "The HP Environment," "System Management," "Introduction to HP's Image Data Base," "Image Optimization," "Cobol Optimization" and a variety of others, a spokesman said.

The courses run from two to five days and cost from \$560 to \$1,400 per person.

The firm also offers a series of advisory services that

help users evaluate different computer systems. These services are tailored for each user and are priced according to the time involved. For example, a five-day evaluation program costs about \$1,600, the spokesman noted.

Additional information on these and other services can be obtained from the firm at 6559 W. 64th St., Chicago, Ill. 60629.

## Lifeline Power Supply Bows

ADDISON, Ill. — Instrumentation and Control Systems, Inc. has introduced the Lifeline uninterruptible ac power supply.

Lifeline was designed to provide continuous power for microcomputer system users, according to the vendor.

The "no-break" power feature provides voltage regulation and line filtering plus an inverter that supplies power only during power

outages, with no interruption to the critical load, the company said.

An internal battery handles the full power of the system for five to 10 minutes, while an external battery may be used to extend operation for one hour or longer if required.

A 200-VA system is priced at \$1,042 from Instrumentation and Control Systems, 529 Interstate Road, Addison, Ill. 60101.

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# Controller, Slave Board Designed for S-100

SACRAMENTO, Calif. — Teletek Enterprises, Inc. has announced the release of two S-100 board products — a hard disk/cartridge tape controller and a slave board.

The Hard Disk/Cartridge Tape Controller (HD/CTC) reportedly can interface two Shugart Technologies, Inc. ST-506-compatible, 5¼-in. hard disk drives and a Qic-02 cartridge tape drive to an S-100 system. An intelligent

controller, it has a Zilog, Inc. Z80A CPU, 8 bytes of random-access memory (RAM) and 16K bytes of read-only memory (ROM). Hard disk drives of 5¼-in., 8-in. or 14-in. can be interfaced to a number of tape backup devices. The HD/CTC costs \$795 each, a spokesman said.

The SBC-11 slave board utilizes Software 2000's Turbodus software and is said to support two users. Each user

is provided with a Z80A (optional Z8001) CPU, 64K bytes of RAM and 2K bytes of erasable programmable ROM (expandable to 32K bytes). Each CPU has one associated Z80A serial I/O providing two RS-232C-compatible serial ports, the vendor said. Each CPU has one 8-bit interrupt vector/status register and one 6-bit command register. Independent addressing of the S-100 I/O space is

accomplished via user-selectable jumpers. The SBC-11 slave board costs approximately \$1,395, a company

spokesman said.

Teletek is located at 4600 Pell Drive, Sacramento, Calif. 95838.

## Adapter Fits IBM Micros, Provides Graphics Aid

MILPITAS, Calif. — Micrographics Technology, Inc. has announced an adapter for the IBM Personal Com-

puter or XT said to replace three IBM adapters with a single module and to provide video graphics functions currently unavailable by any other means to IBM computers.

The Mastergraphics I adapter reportedly provides Personal Computer and XT users with extra slot space, while extending the graphics power of their machines. It is part of the modular Mastergraphics System, which is fully compatible with all personal computer hardware and software from IBM.

The device is said to increase active colors from four to 16, quadruple the display storage provided by the IBM adapters from 16K bytes to 64K bytes and allows higher resolution in color and monochrome — 640 pixels by 200 pixels (16-color) and 768 pixels by 340 pixels (monochrome).

Functions include Masterpalette, an adapter that increases available colors to 4,096; Masternet Programmer hardware and software to allow any user to generate custom character sets quickly and a Dual Display kit for simultaneously attaching a color and a black-and-white monitor to the IBM micro.

The Mastergraphics I adapter costs \$579, from Micrographics at 1820 McCarthy Blvd., Milpitas, Calif. 95033.



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# Reach Out to End Users, DP Managers Told

By Bill Laberis  
CW Staff

BALTIMORE — To borrow a phrase from a popular commercial, DP shops should reach out and touch someone — and that someone is the end user, who is more and more often threatening to design and implement his own office system if the DP department won't make an overture to help.

That was the message at the recent conference of the Data Processing Management Association, where DPs got an earful of strategic ideas for gaining more control over the implementation of office automation, even when this implementation is largely out of their purview.

"Make certain you have your people available to the OA people on a friendly basis. Don't try to bulldoze your

*'Make certain you have your people available to the OA people on a friendly basis. Don't try to bulldoze your way in.'*

— Mary M. Greenwood, consultant.

way in," advised Mary M. Greenwood, consultant with Greenwood and Associates of Baltimore and a speaker at one of the conference seminars.

Mary Greenwood and Frank Greenwood outlined a shopping-list approach to effective DP interaction with the user community in implementing office systems. Their approach was designed to combat the implementation of patchwork systems that can result when design is carried out without some centralized planning.

Their approach was also intended to confront what some end users see as DP's refusal to

share computing power with non-DPs. Said one end user at the seminar, "People are going out and buying micros, getting answers on their own, while the DP department is still spinning its wheels. End-user computing is a fait accompli, so DP had better get used to it."

According to the Greenwood, DPs are often perceived as oriented more to their technology than to the organization that employs them and its goals. Thus, when management looks for someone to implement the concept of information as a corporate resource — one that

is to be managed accordingly — there are often reservations about involving DP managers in the process, the existing systems investment notwithstanding.

The Greenwood's recommendations for effective DP strategy in office systems implementation included:

- Help end users develop a long-range plan. DPs are accustomed to doing this with their systems strategies.
- Let end users know what is feasible. Frank Greenwood said that users "see a television ad and think they can do just about anything with computers."
- Help end users prepare a commercial solicitation to gauge what the vendor community has to offer.
- Help implement the solution chosen, standing by with technical assistance.

## Of Total Office Integration

## WP, E-Mail Seen Only the Beginning

By Jim Bartimo  
CW Staff

CHICAGO — Word processing and electronic mail are the baby steps toward total office integration, according to consultants. Susan S. Kay,

Kay, who is senior consultant for Hannagan & Associates, Inc. of Schaumburg, Ill., addressed a session on office integration at the Integrated Office Technology Conference and Exposition held here recently. She also reviewed some current integration technologies and predicted what the future may bring.

Among various electronic mail systems on the market today are facsimile, communicating word processors, telex and TWX, store-and-forward systems, voice messag-

ing and computer-based message systems (CBMS), such as IBM's Professional Office System.

"You will see CBMS take over for many of these technologies," Kay said. "One of the ways CBMS will become the prevalent electronic mail system is what it is used to connect the user to an information inquiry data base. This connection gives users access to both word processing and a selected category of corporate data."

One major step to office integration will be connecting electronic mail to the data base and tying the data base to the word processing system to complete the circle, Kay said.

Kay also noted that the data processing department must become involved in order for office automation to become truly

integrated with the corporate data base. For example, "99% of the data base used here is from the data processing department," she said.

Referring to some other emerging office technologies, Kay predicted that Wang Laboratories, Inc.'s Professional Image Computer and other image processors will have little immediate impact on office integration, but called combination terminal/telephones "one of the slickest things to hit the hardware market."

Although combination terminal/telephones represent mainly a hardware integration and not necessarily a functional integration, Kay suggested that "just because we're not integrated to the point we want to be doesn't mean you can't get some benefits out of what is there."

## Matrix Printer Operates In Three Modes

CHARLOTTE, N.C. — Datasonix Computer Corp. recently announced a matrix printer that operates in three modes with micro- and mini-bus systems.

The DS220 multimode matrix printer provides multiple type fonts that may be selected using the operator panel or the program control. Included as standard are two correspondence-quality fonts, two memo fonts, variable-pitch draft fonts and micro character set as well as seven international character sets, a vendor spokesman said.

In correspondence mode, the device generates "near letter-quality" 18- by 48-dot matrix at 40 char./sec.; in high-speed print mode, the device operates at 220 char./sec. with a nine- by seven-dot matrix; a graphics feature reportedly is able to print up to 217 columns for spreadsheet.

The printer is priced at \$1,995, and more information is available from Datasonix, 4216 Stuart Andrew Blvd., Charlotte, N.C. 28210.

## Enhanced Version of Decmail Gives Word-11 Users E-Mail

ANAHEIM, Calif. — Data Processing Design, Inc. has announced an enhanced version of Digital Equipment Corp.'s Decmail designed to provide users of the vendor's Word-11 word processing software with electronic mail capability.

Decmail Plus, a menu-oriented package, is said to run on DEC's RSTS/E operating systems equipped with Word-11, allowing users to create and store documents or messages or send them to other terminals or users within their com-

puter system.

Decmail Plus reportedly allows users to send messages either to specified terminals, specified users or to all users within either a single computer system or a network of computers.

The introductory price for Decmail Plus for users operating under RSTS/E is \$3,500 for the first license and \$1,750 for second-ary licenses. More information is available from Data Processing Design, 1400 N. Blythe, Anaheim, Calif. 92807.

## Wizard Mail Operates With CICS

GREENVILLE, S.C. — Steel Heddle Products, Inc. has introduced an electronic mail system for office automation applications.

Wizard Mail is said to operate with any IBM CICS or Vm host computer. Uses of the system include the ability to broadcast messages to all computer users, optional automatic hard-copy printout of each message, confidential message recognition,

message priority assignments, status of mail sent, tracking recipients wherever they are signed on and monitoring the status of messages.

Wizard Mail is menu-driven and can reportedly be used on all terminals with access to host computer systems.

It is priced at \$495 from Steel Heddle Products through P.O. Box 1867, Greenville, S.C. 29602.

OFFICE AUTOMATION

## Package Lets VAX-11 Users Exchange Information

NEWPORT, R.I. — Aquidneck Data Corp. recently announced an office automation package said to allow Digital Equipment Corp. VAX-11 series users to exchange information between five different office application programs.

The VAX Office Exchange provides full transfer of information from one program to another and transfer of entire files and documents from one user to another.

All applications, including data base management system, word processing, spreadsheet, electronic mail and graphics are reportedly integrated into one menu that prompts the operator for successive commands.

The seven-module system can be purchased unbundled with individual prices ranging from \$2,000 to \$3,000. Aquidneck Data can be reached through P.O. Box 639, Newport, R.I. 02840.

## WP Package Runs on Wang 220

RICHTON PARK, Ill. — Basic Computer Services, Inc. has announced a word processing package for use with spreadsheets, electronic mail and client data base files.

Perfect Composer operates on Wang Laboratories, Inc. 220 computers and includes global editing, margin, tab and pagination controls.

PROVO, Utah — Lytron Systems, Inc. has announced a microcomputer office integration package said to allow users to combine all data and applications software into one integrated, menu-driven system.

The Lytron Office Integration Software (Lois) package reportedly allows a user to bring together and

Perfect Composer is also said to contain mail merging features that allow the generation of letters with specific material such as name, address, account number and amount due. Priced at \$495, the package is available from Basic Computer Services at 3699 Sauk Trail, Richton Park, Ill. 60471.

integrate software from almost any source. The company said a user can move data among different software applications and move from one application to another without returning to the operating system.

The product also reportedly includes a variety of tools such as a calendar, calculator, scratch pad, phone manager and a talk facility. It can be configured for a stand-alone microcomputer or local-area network.

The package operates with Microsoft, Inc.'s MS-DOS operating system. It is available in a stand-alone version for \$1,495.

More information is available from Lytron Systems, 1675 N. 200 West, No. 2, Provo, Utah 84604.

## Course Diskettes Cover Visiword

NAPERVILLE, Ill. — Deltak, Inc. has announced the availability of self-paced course diskettes to help IBM Personal Computer users teach themselves the key word processing functions of VisiCorp's Visiword WP system.

"Teach Yourself Visiword on the IBM Personal Computer" reportedly helps users learn how to interpret and access menus, how to access functions and options, how to create a document on disk and how to edit documents; using menus and function keys.

Users of the course must have access to an IBM Personal Computer with a minimum of 64K bytes of memory running under DOS, at least a single diskette drive and an IBM video terminal.

Priced at \$70, the course is available from Deltak, East/West Technological Center, 4751 W. Diehl Road, Naperville, Ill. 60566.

## Series Targets Real Estate Execs

MCLEAN, Va. — PRC Realty Systems, a division of Planning Research Corp., recently announced a software package bundled with the IBM Personal Computer in a system designed for real estate executives. The PRC Execupro Series includes four software application packages for residential financial analysis, sales management, accounting and word processing, a vendor spokesman said.

The IBM Personal Computer includes the UCSD P-system and 256K bytes of memory.

The complete package is available for \$6,300, and the software alone is priced at \$1,800.

More information may be obtained from PRC Realty Systems, 1500 Planning Research Drive, McLean, Va. 22102.



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## Industry Groups Pleased

## House OKs Export Administration Bill

By Jake Kitchner

CW Washington Bureau

WASHINGTON, D.C. — The U.S. House of Representatives has approved an export administration bill that embodies many of the features sought by the electronics and other high-technology industries.

The bill, in the form of amendments to the 1979 Export Administration Act, which expired a month ago but remains in force through emergency-

powers authority invoked by President Reagan, calls for the government to rely much more on consultations with Congress on U.S. allies in setting and implementing export controls. It is also expected to ease restrictions on American exports to friendly countries, making U.S. firms more reliable suppliers in the eyes of overseas cus-

tomers.

The Senate has yet to act on its version of the export act amendments, and with congressional adjournment scheduled for the end of next week, it is unlikely the legislation can be completed this year unless, as is now expected, the House and Senate return for a final session in December.

"The House has passed something we're really happy with," commented Lloyd Kaufman, director of trade programs for the Computer Business and Equipment Manufacturers Association. In particular, he said, "industry was surprised" the House turned back a Defense Department bid to grab greater

(Continued on Page 158)

## Boom in Small Computers Fueling Development of 3½-In. Microfloppy

By Robert Batt

CW West Coast Bureau

MENLO PARK, Calif. — The rapid growth of the small business computer market with its attendant shift to smaller desktop units and portable designs is accelerating the development of new data storage configurations.

One of the configurations that is receiving a lot of attention from industry analysts and manufacturers is the 3½-in. microfloppy disk, which some pundits predict will replace the traditional 5¼-in. minifloppy disk at the lower end of the computer range.

The 3½-in. microfloppy, pioneered by Sony Corp. and now manufactured by Hewlett-Packard and Co., Shugart Associates, Tandon Corp. and Mitsubishi Corp., among others, recently received a major boost to its fortunes when IBM withdrew from the market its potential rival, the 3.9-inch disk.

The 3½-in. disk, which has the support of manufacturers comprising the Microfloppy Industry Committee, has a single-sided capacity of 500K bytes. It is said to provide the same storage capacities as the 5¼-in. systems but with a faster data transfer rate. Sony has also recently announced plans to pro-

duce a double-sided 1M byte microfloppy available in the second quarter of 1984.

According to HP, which has shipped over 25,000 3½-in. devices, reliability is four times better than the standard 5¼-in. minifloppy, due to its rigid case

and automatic shutter protection system.

HP claimed that by going to the 3½-in. system, it has been able to reduce prices by 30% in each of the last two years. As a result, the company said it has

(Continued on Page 154)

## Sony Production Figures Illustrate Disk's Popularity

The rising popularity of the 3½-in. microfloppy disk is well illustrated by the production figures of its pioneer, Sony Corp.

In 1982, the first year of production, volumes at the Japanese manufacturer were a little over 5,000, according to Myles Tintle, general manager of Sony's Data Products Division. By the end of this year, the company expects to have shipped 140,000 of the 3½-in. units.

Furthermore, 1984 is anticipated as a take-off year for the company with volume shipments reaching over 600,000, the bulk of them to be used in personal and portable computers.

However, the trend to-

ward more end-user computing does not mean that in the mass storage market the 3½-in. disk will have the field all to itself. Several alternative technologies are also emerging, the most promising of which appears to be optical data storage.

According to its proponents, the cost of optical data storage per 1M byte should be considerably less than that of magnetic disk storage due to its potential for storing substantially greater amounts of data on a single optical disk than on a magnetic disk of the same size.

According to a report issued by Drexler Technology Corp., a Palo Alto, Calif.,

(Continued on Page 154)

## 'We Goofed,' Olsen Says Of DEC Loss

By Bill Laberis  
CW Staff

BOSTON — "I never thought I'd have to come here and explain why we goofed up. ... It is hard to explain how a computer company can get into administration problems. Our sales pitch is that we will usually save you from them."

In this way, Kenneth Olsen, president of Digital Equipment Corp., kicked off the company's recent annual meeting as he

(Continued on Page 152)



CIV Photo by S. Levine

Facing the music, Kenneth Olsen, DEC president, makes a point at the company's recent annual meeting.

# Top Quarterback in the EDP

Why Beall?

1

2

3

John Beall &amp; Company, Inc.



COMPUTER INDUSTRY

## SEC Inquiring Into DEC Officials' Stock Sale

MAYNARD, Mass. — Three Digital Equipment Corp. officials, including the company's head of the personal computer group and its vice-president of finance, sold company stock the month before DEC announced its worst quarterly profits in seven years.

A DEC official confirmed last week that the Securities and Exchange Commission (SEC) has made inquiries into the stock sales, adding that such inquiries "are a matter of routine ... whenever a company's stock value rises or falls sharply."

DEC's stock plummeted 30% on Oct. 18, the day the company announced its quarterly profits would fall 65% to 75% below the first quarter a year ago. The results were fol-

lowed by the filing of several shareholder lawsuits, which are presently in litigation.

The company verified the trading of three top officials, including:

- Joel Schwartz, chief of DEC's personal computer operations, who sold 1,000 shares — more than half his DEC portfolio — at the end of September. DEC's original earnings estimate blamed poor personal com-



puter sales for part of the dismal financial results.

- Edward A. Schwartz, vice-president and general counsel, who sold

2,400 of his 2,750 shares on Sept. 6.

- Alfred M. Bertocchi, vice-president for finance and administration, who sold 702 shares in mid-September, retaining 10,400 shares.

The DEC spokesman said company President Kenneth Olsen, who owns more than 2.4 million shares of DEC stock, "did not sell any recently, nor has he done so in years, as far as I know."

## Administrative Problems to Blame: Olsen

(Continued from Page 151)

steered for the inevitable questions that would follow concerning DEC's sudden and dramatic fall from grace on Wall Street.

Speaking to nearly 400 shareholders, analysts and members of the press, Olsen cautiously told his audience that any failure by DEC to return to "normal" levels of profitability

can be blamed on "poor management." Five shareholder lawsuits lodged against DEC in recent weeks prompted Olsen's caution in discussing the state of the firm's future financial performance, he said.

The suits followed the revelation that quarterly earnings for the mini-computer maker would fall 73% below earnings the same quarter a year earlier, which was also a relatively poor quarter. DEC's stock lost one-third its value the days following its earnings estimate, as investors and shareholders sought answers to the unexpected decline.

At the meeting, Olsen told them little they hadn't already heard and declined to elaborate much on what he termed the administrative problems that led to DEC's current problems.

The administrative problems, which resulted in inaccurate sales projections being transmitted to corporate management, were the product of "simply changing too many things at one time," Olsen offered. Order processing, in particular, suffered, such that some orders were counted twice and others were not recorded at the shipping point at all.

Asked by one analyst why administrative procedures decayed so rapidly, Olsen replied, "I can't explain why so many administrative groups [within DEC] should have changed at the same time."

Steering clear of explaining further details of DEC's administrative woes — which he said will be rectified within months — Olsen instead directed his prepared remarks largely at the company's product offerings, reiterating time and time again that DEC's commitment to technological excellence will restore the company to financial health. He shared the stage with a variety of DEC's newest products, including the yet-to-be-announced Microvax workstation.

But even when speaking of DEC's product lineup, Olsen was on the defensive, frequently rebutting criticism that the company has often been late in bringing certain products to market.

Olsen admitted that slack sales of the company's personal computers were caused in part by a lack of third-party software, admitting further that many independent suppliers will write for IBM's micros first and DEC later.

He also admitted that DEC's research and development team "made some false starts" in failing to apply a systematic approach in the development phase of a high-end VAX superminicomputer — to be announced next year.

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## Microfloppy Gaining in Popularity

(Continued from Page 153)  
shipped more 3½-in. units than its 5¼-in. and 8-in. disk drives combined.

"The new benefits of reliability, cost of ownership, size modularity and integrated appearance have given us an overwhelming customer acceptance, and for this reason we have committed that all floppy-based systems will use the 3½-in. microfloppy as their standard I/O device," a recent HP internal paper revealed.

The question of standards is a critical one for the future of the 3½-in. disk. Currently, there are four different standards being proposed for the microfloppy by the American National Standards Institute X3B8 technical subcom-

mittee. However, it is believed that many more 3½-in. units have been shipped to customers than the other sub-4-in. formats. Approximately 23 computer, peripheral and media manufacturers have endorsed the 3½-in. configuration.

"With the present trends and support of a large number of companies, the 3½-in. disk will probably become a de facto standard before official acceptance is granted,"

said Howard Dicken, president of DMI Data, Inc.

The rapid growth of the 3½-in. unit is closely tied to the continuing expansion of the microcomputer market. According to one estimate, in 1982, 2 million personal computers were installed. By 1986, this figure is expected to climb to 12 million. Sony, for example, has just incorporated the 3½-in. disk in its first microcomputer, the SMC-70.

## Success of Disk Backed By Production Figures

(Continued from Page 151)  
based company specializing in optical storage techniques, optical storage media is believed to have much longer data retention periods compared with disk storage.

"Optical data storage systems could have advantages over presently available media where a combination of data compactness, relatively

fast access, long storage life and relatively low cost per megabyte is desirable," according to the Drexler report.

Potential applications are believed to include auxiliary computer memory, archival storage of document images and data and information storage on credit and identification cards.

## Apple Posts 69% Increase In Net Sales

CUPERTINO, Calif. —

Apple Computer, Inc. reported a 69% increase in net sales to almost \$1 billion for the fiscal year ended Sept. 30. Earnings were up 25% as the company increased its spending by 77%.

Earnings increased to \$77 million, or \$1.28 per share, up from the \$61.3 million, or \$1.06 per share, reported in fiscal 1982. Net sales jumped to \$982.7 million for the year, which is in contrast to sales of \$583 million reported last year.

The company's increased spending was dramatically evident during the last quarter as sales grew 55% over the same period last year, but earnings were only \$5.1 million, or eight cents per share, compared to last year's corresponding fourth-quarter earnings of \$18.7 million, or 32 cents per share.

John Sculley, president and chief executive officer, reported that "market conditions and several strategic decisions which were made to strengthen the company" cut into the earnings increase.

During fiscal 1983, the company saw an increase in costs and expenses from last year's \$480 million to \$653 million. Spending for research and development rose to \$60 million from \$38 million; marketing and distribution rose to \$230 million from \$120 million; and cost of sales rose to \$508 million from \$288 million.

Sculley said the company ended the year "in a strong financial position" with \$143 million in cash, working capital of \$340 million, shareholders' equity of \$378 million and total assets of \$557 million.

# NEW MATRIX PRINTER OUT PERFORMS ITSELF 3 TO 1.



## Buyout Seen CDI's Main Hope

By Patricia Keefe  
CW Staff

A buyout by a larger company hoping to gain a foothold in the micro marketplace is Computer Devices, Inc.'s main hope for survival following its Oct. 31 filing for bankruptcy, according to Alex Stein, senior analyst for Dataquest, Inc., a San Francisco-based research house. A "modestly success-

ful" manufacturer of typewriters for 10 years, Computer Devices has made several attempts to enter the microcomputer market, according to Kenneth Bosomworth, president of International Resource Development, Inc. Seaforth M. Lyle, who recently resigned as company president, was encouraged by the board of directors to take a new run

at the market, Bosomworth added.

The "new run" resulted in the development of the DOT<sup>®</sup> portable microcomputer, which has floundered because it does not meet the requirements of any specific user, according to Stein. In addition, he said the DOT offers users a 3½-in. disk as opposed to the standard 5¼-in. (Continued on Page 156)

## Computer Devices Files for Chapter 11, But Shop Still Open

By Patricia Keefe

CW Staff  
BURLINGTON, Mass. — Computer Devices, Inc. became the second portable microcomputer vendor in less than two months to file for protection from its creditors under Chapter 11 of the U.S.

Bankruptcy Code. Court papers were filed Oct. 31 in U.S. Bankruptcy Court in Boston.

However, the vendor has not shut down operations. Rather, it plans to unveil an IBM-compatible version of its DOT portable microcomputer at the fall Comdex show later this month. A January delivery date is slated for the new micro, said to offer a 9-in. screen, 128K bytes of memory, double disk drives, an integrated printer and color port monitor.

Corporate counsel Mark Manski blamed the company's problems on a combination of some "internal marketing" and "decisions" concerning the DOT, a lack of funds and a highly competitive marketplace.

"We were either ahead of our time by 12 months [by using a 3½-in. disk on the DOT] or we misread the public need for IBM compatibility. Actually, it's probably a combination of both," Manski said, referring to the inability of the DOT to run most IBM Personal Computer programs. "We really underestimated the dominant role of IBM, and it hurt us."

### Employees Laid Off

As a result of the bankruptcy petition filed two weeks ago, 81 employees were laid off, leaving a work force of 129, according to Manski. In addition, Seaforth M. Lyle, company president and chief executive officer, resigned and was replaced by Executive Vice-President Robert J. Moore, who joined the firm in August.

Computer Devices has been in financial trouble for the last 12 months, laying off nearly 40% of its staff by August, Manski said. Bankruptcy papers were filed after "the company reached a level of cash insufficient to meet the payroll," he added. Efforts launched two months ago to find a merger partner to provide much-needed financial support had failed, although Manski claimed talks are currently under way with at least two potential suitors.

Also, although a public offering of shares in July netted the firm \$10.4 million, Manski said that \$6 million was paid immediately to the Bank of New England which, he added, has refused to advance the firm any more money.

Court documents filed by Computer Devices in U.S. (Continued on Page 156)

## INTRODUCING THE NEW DS220 MULTI-MODE MATRIX PRINTER

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And those are just the printing capabilities. In other respects, the DS220 outperforms not just itself but virtually every other printer on the market. Its front panel programming sets new standards in user friendly printer ergonomics. Its four digit LED display and push button panel allow programming of over fifty features, with a minimum of fuss and confusion. Those features include a variety of interface and communications selections that allow compatibility with a wide range of mini and microcomputers. And the DS220 handles six part forms with its adjustable tractor feed, as well as cut sheets and letterhead with its friction feed.

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## Plans for Updated DOT Continue Despite Filing for Chapter 11

(Continued from Page 155)  
Bankruptcy Court in Boston list total assets at \$18.6 million and liabilities of \$7.6 million. From a list of about 640 creditors, the vendor owes more than \$250,000 (\$346,196) to only one creditor, Sony Corp., according to Manski. Other creditors included Keytronic Corp., Future Electronics, Marshall In-

dustries and Digital Equipment Corp. Before the bankruptcy filing, some of the suppliers had halted equipment deliveries, Manski said.

The firm soon will file a business plan with the court, Manski said. Like portable micro vendor Osborne Computer Corp., which two months ago filed under

Chapter 11, Computer Devices is hoping to gain enough financial support to complete production of an upgraded, IBM-compatible version of its troubled portable, which it believes will solve most of its problems.

Unlike Osborne, Computer Devices does have another product line to fall back on, its Series 2000 line of thermal printers, which it concentrated on selling for about 10 years before testing the micro market waters.

## Buyout Seen CDI Hope For Survival

(Continued from Page 155)  
in, disk and, so, lacks compatibility with most of the available software.

As a result, the DOT was never able to attain a sufficient level of distribution and couldn't compete against any of the major IBM-compatible companies, such as Compaq Computer Corp., Bosomworth said. Agreeing that the small disks had caused problems, he noted they also added to a product's portability.

"Computer Devices had a viable product line all along," Bosomworth said, adding that "a lack of customer enthusiasm and satisfactory distribution with the DOT" was the problem. Computer Devices' woes "demonstrate that it is very difficult to get a product positioned and distributed."

Stein maintained there is "no way" Computer Devices could compete in the battle for the corporate micro environment without the compatibility or standard the industry requires, particularly as more of the big-name vendors, such as IBM, Digital Equipment Corp. and Wang Laboratories, Inc., enter the business micro market.

While it is true that some of the smaller micro firms could turn a profit after only a few large-volume sales, Stein pointed out that they do not seem to realize how difficult it can be to land those sales.

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## On Minimum Wage Requirements

# Federal DP Service Contract Exemption Issued

By Jake Kirchner

CW Washington Bureau  
WASHINGTON, D.C. — The U.S. Department of Labor has issued its long-awaited exemption of federal DP service and maintenance contracts from government-imposed minimum wage requirements.

First proposed more than two years ago, the regulation exempts maintenance and repair of DP equipment, office systems and high-technology scientific and medical equipment from the provisions of the 1965 Service Contract Act.

That law was passed to protect primarily low-paid service workers from wage busting by employers try-

ing to win federal contracts. In 1977, Labor proposed to extend the act's coverage to other industries, including federal data processing maintenance.

A number of computer firms and the Computer and Business Equipment Manufacturers Association (Cbema) have been fighting the proposal ever since.

Those firms argued that their service workers are relatively highly paid and are in such demand that they do not have to worry about their wages being held down by firms seeking government work which, they said, is only a minimal part of their business anyway. They

also said the regulation would ruin their merit pay systems and force them to refuse government contracts.

The government's procurement agency, the General Services Administration, agreed with that assessment and backed the exemption, claiming the law would hurt agencies' ability to procure equipment maintenance and repair. The U.S. General Accounting Office of Congress also said the exemption, opposed by organized labor groups, should be granted for this category of service work.

In its final rule, published late last month, Labor said it had determined

that "wage competition in the [DP service] industry is not a significant factor in obtaining federal contracts."

It said it was granting the exemption because "the affected employees are relatively highly paid pursuant to complex merit pay systems and because the nature of the industry... is such that price competition based on labor costs and concomitant wage abuses are unlikely to occur."

Labor also concluded that the exemption is needed "to avoid the serious impairment of government business."

The department ruled that federal contract officers must police compliance with the exemption's conditions and, when approving service agreements, certify that the firms will use the same compensation plan for employees on government and commercial contracts.

Following publication of the exemption, Cbema President Vico Henriques issued a statement hailing Labor's decision. Henriques called the decision "the sensible, cost-saving approach," which has kept the government from "squandering taxpayer dollars through unnecessary regulation."

## House OKs Bill; Industry Groups Like Changes

(Continued from Page 151)

export licensing authority from the Commerce Department, which currently has priority authority to license high-technology exports.

Kaufman also said the computer industry was pleased the bill contained a provision for a "comprehensive operating license," authorizing a one-time license for exports of goods and technology between U.S. firms and their foreign subsidiaries, affiliates and licensees. This and other types of multiple export licenses approved in the bill would eliminate burdensome requirements to obtain licenses for individual exports to approved organizations, industry spokesmen said.

The bill also seeks to force the government to reduce or eliminate export controls on items available from foreign sources and to remove controls on items that are routinely approved for export. In addition, licenses for goods containing microprocessors could not be denied solely because of the microprocessor component, but would require a determination that the chip could make "a significant contribution to the military potential" of another country.

The House bill would provide expanded penalties for anyone attempting to export controlled items illegally. Whereas the House amendments would be in force until Sept. 30, 1985, the Senate version calls for a six-year span. Observers here expect a compromise somewhere between the two versions' time frames to be reached before the final bill is ready for the president's signature.

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## Forecasts & Findings

### Eight-In. Disk Dead?

The 8-in. floppy disk will ultimately be eliminated from the microcomputer data storage market by the 5¼-in. rigid and floppy disk systems; but the 5¼-in. category, which accounted for 97% of the microcomputer magnetic media market last year, will find its market share declining dramatically, as the sub-5-in. Winchester and microfloppy disk systems erode its dominance, according to a study by Creative Strategies International, Inc.

"Mass Storage Media Technology, Evolution and Opportunities" predicts that the 3½-in. hard-pocket disk will take the lead in the microfloppy industry, accounting for as much as 50% to 60% of the U.S. market. Magnetic tape, bubble memory and optical disk markets will grow, but will find minor roles in the microcomputer storage market through the 1990s, the report declared, predicting that emerging magnetic media technologies will stave off challenges at least until the beginning of the 1990s.

The report is priced at \$1,450 and is available from Creative Strategies International, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

### Mainframe, Micro Blitz

Users will show a nearly insatiable demand for processing power over the next five years, and the volume of worldwide computer shipments from U.S. suppliers will grow at a compound rate of 17.3% during that time, according to a report released here by International Data Corp. (IDC).

According to "Computer Industry Review and Forecast - 1977-87," personal computers have blitzkrieged the user market and are destined to become the largest computer market of all. The report declares, "In 1981, the value of personal computer shipments to the U.S. market passed those [sic] of terminals; in 1982, small business computers fell; 1983 will leave the minicomputer market behind; and by 1984, the once slimsy general-purpose market will succumb."

However, IDC claims that somewhat unnoticed has been a renewed sense of enthusiasm for the mainframe market, especially at the high end, albeit dominated by IBM at the expense of the five noncompatible companies. The minicomputer market will continue to grow at an 18.8% rate over the next five years, as vendors emphasize a single architecture from the desktop computer to the powerful superminis that have increased performance into what was once the mainframe realm.

The 80-page report is available for \$325 from Department M, IDC, 5 Speen St., Framingham, Mass. 01701.

### Year of the Desktop?

This is the year of the desktop computer, according to "The Professional Computer," a 200-page report in The Technical Office series from The Yankee Group, which reports that worldwide microcomputer sales have increased this year from 1.5 million units to 3.3 million units and from a value of \$5.4 billion to \$10.5

billion.

Of the micros classified by The Yankee Group as desktops, 35% are going into the Offices of Fortune 1,000 companies; 37% are purchased by small businesses and independent professionals; 10% are acquired for scientific and engineering use; 3% are bought for educational institutions; 10% are purchased for a mix of applications by elite consumers in the home market; and the remaining 3% are acquired for industrial applications.

The study projects that shipments of desktops will expand at almost a 60% cumulative annual growth rate through 1987, but in North America at only a 40% annual growth rate. Portable computers, however, will

experience growth rates in excess of 100% over the next two or three years, according to the report.

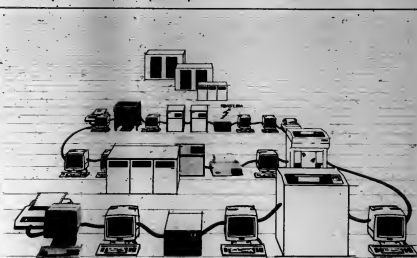
The study is priced at \$950 from The Yankee Group, 89 Broad St., Boston, Mass. 02110.

### Floppy Price Dilemma

The single most crucial issue facing floppy disk drive manufacturers today is in offering the most cost-effective product with maximum data capacity in the smallest space; but while higher performance can be achieved, total price becomes a barrier to user acceptance, according to "The Floppy Disk Drive Industry: A Strategic Analysis 1983-1987," recently published by Venture Development Corp.

Prices over \$1,000 have discouraged interest in high-performance disk drives, perhaps because of competition from low-priced hard disks, and the average number of drives per small business computer system will decline from 2.4 units in 1982 to 2.0 units in 1986, according to the report.

The study provides installed base estimates and manufacturer market shares and forecasts shipments in units and current dollars for several product categories in addition to profiling manufacturers and recommending competitive strategies. Priced at \$2,790, the 175-page report is available from Venture Development at 1 Washington St., Wellesley, Mass. 02181.



## 3270 Networking: No More No Man's LAN.

Imagine. 3270 Processing. IBM-Compatible Personal Computing. Local Area Networking. And SNA Compatibility. In One System.

Imagine a system that successfully settles the uncharted territory of 3270 local networking—that "no man's LAN" of unlinked and unrealized potential.

Imagine a system that delivers the power of 3270 processing, and the flexibility to build two local area networks from a single controller. Imagine being able to attach up to 120 devices to that controller. Or attaching four distinct controllers—and multiple coaxial links of up to 10,000 feet each—to any of those LANs.

Imagine the economies of a system that handles that networking with standard 3270 coax. That requires no commitment to special architectures or non-standard LAN technologies. And that, thanks to a multi-drop, station-to-station design, can eliminate thousands of feet of new coax.

Of course, such a system would have SNA compatibility. But it would also have a set of capabilities to dramatically increase throughput, while reducing hardware and support costs in any environment. Capabilities like multi-host and multi-personality support, application and address switching, and system printing. This system would have multi-user personal computing "built into" the network—allowing you to

assign true 16-bit computing power, maintain overall MVS control, and share expensive disks and printers.

Such a system would boast an intelligent display station that displays a mastery of ergonomic and aesthetic design. With multi-screen formats, anti-glare screen, low-profile keyboard, and a tilt-and-swivel pedestal with the smallest footprint in the industry. Such a system would also include a full line of printers.

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## Mostek: U.S. Needs to Open Semi Trade With Japan

By Robert Batt

CW West Coast Bureau

SAN JOSE, Calif. While the semiconductor industry does not employ as many people as some of the older U.S. smokstack businesses, its importance for the entire economy is vital. Semiconductor imports should become more of a priority in Washington, D.C., following last week's visit to Japan by President Reagan, according to a senior industry executive.

The president's trip should underscore needed changes in semiconductor trade between the two nations, according to James Byrne, senior vice-president for business development at Mostek Corp. "If we lose our leadership in this arena, it will have dire consequences for our country," he said in a recent interview. The strategic importance of the semiconductor industry is still not sufficiently understood in Washington, D.C., he added.

That Japan, the world's second strongest economy, is essentially closed to U.S. chip manufacturers should be a cause for concern, he said. "It is important that the problems be discussed at the very highest levels of government," Byrne said. The Mostek executive and seven other top industry officials made a visit to Japan last month in an effort to increase U.S. semiconductor shipments to Japan through the setting up of new, long-term relationships with Japanese equipment manufacturers.

### Met With Officials

Those executives, including Robert Noyce, vice-chairman of Intel Corp., and Joseph Boyd, chief executive of Harris Corp., met with representatives from 22 Japanese vendors and suppliers, as well as senior government officials.

"It now appears that a political framework is emerging that allows for the possibility of increasing the U.S. semiconductor presence in Japan," claimed Warren Davis, director of government affairs for the Semiconductor Industry Association (SIA), who also went to Japan.

Davis said sufficient progress has been made by the 18-month-old U.S.-Japan High-Technology Working Group to warrant delaying the threat of U.S. retaliation for what domestic suppliers see as unfair Japanese practices, including government-subsidized cartel policies. The group was born of a joint effort by both countries.

Nevertheless, Davis warned, the patience of U.S. manufacturers is limited. "We would expect to see a significant improvement in the U.S. semiconductor trade with Japan over the next six to 12 months. Currently our market share is 10%, and we will expect to see that climb to 20% to 30% in a fairly short time span," the SIA executive said.

Earlier this year, the SIA prepared a draft petition under Section 301 of the U.S. Trade Act of 1974, alleging that target industry practices in Japan unfairly deny access to U.S. firms and called on the Department of Commerce to exert pressure on the Japanese to open up its markets. The

*"It now appears that a political framework is emerging that allows for the possibility of increasing the U.S. semiconductor presence in Japan."* — Warren Davis, director of government affairs for the Semiconductor Industry Association.

SIA decided to postpone submission of the petition to the government because of the apparent progress being made by the High-Technology Working Group.

## AT&T Information Systems Inks Pacts With HP, Wang

MORRISTOWN, N.J. — AT&T Information Systems here announced agreements recently with both Hewlett-Packard Co. and Wang Laboratories, Inc. to develop interfaces between the companies' products.

In a prepared statement, AT&T said the agreement covers plans to forge a digital, multiplexed interface linking AT&T's Dimension System 85 voice and data private branch exchange to HP and Wang equipment.

The interface will be made public early next year, AT&T said. As part of the joint agreements, Wang

will license AT&T on its recently announced document communications specifications.

The interface will permit texts written on Wang machinery to be transferred to the AT&T System 85, where it will be converted to electronic document communications format, AT&T said.

Development of the interface between HP and AT&T equipment will involve certification of HP hardware with the System 85. The interface was described in AT&T's statement as a 1.544M bit/sec digital switch, opening up 23 data channels.

# Announcing the State of the Smart.

## IBM 3270 Personal Computer



# Shareholders Approve Harris-Lanier Merger

MELBOURNE, Fla. — Shareholders of Harris Corp. at their annual meeting here recently approved the merger of Lanier Business Products, Inc. into Harris, as did shareholders of Lanier. Also, Harris announced a 16% increase in earnings for the first quarter ended Sept. 30.

The Lanier acquisition, labeled a merger by Harris [CW, Aug. 1], will result in Lanier operating as a subsidiary of Harris. Lanier's chairman, Gene H. Milner, was elected to the Harris board following the annual meeting and will continue to head Lanier.

The arrangement is reportedly valued at about \$275 million, with 525 shares of Harris traded for each of the 15 million shares of Lanier.

Joseph A. Boyd, chairman and chief executive officer of Harris, described the new relationship as "very synergistic."

Harris reportedly intends to use its communications expertise in attempting to link its large systems with Lanier's stand-alone terminals and other office automation products.

## Deal Combines Strengths

The deal, Boyd said, "brings together Harris' state-of-the-art technology in information processing, communications and semiconductor and Lanier's outstanding sales, service and distribution capabilities in the office products area. With these combined strengths, Harris now has

a very powerful presence across the total spectrum of the rapidly growing office automation market."

During a New York meeting with security analysts following the announcement of the impending acquisition [CW, Aug. 15], Boyd said Lanier will operate as a relatively autonomous sector of the Harris organization for a year or two.

The quarterly report issued a few days prior to the shareholders' meeting indicated net income for the first quarter of \$14.3 million, or 45 cents per share, in comparison to \$12.3 million, or 39 cents per share reported in the first quarter in 1982, from operations that are presently continuing. It was a drop from total income in the first quarter of 1982 of

\$14.7 million, which reflected \$2.4 million in operations since discontinued.

Sales revenue increase, reflecting the discontinued operations, was \$350 million for the first quarter of this year in comparison to the \$342 million reported one year ago. Boyd said that total orders booked in the first quarter of 1983 increased 26% over a year earlier and exceeded shipments.

## STC Ultimacc Acquires Global Software

WALDWICK, N.J. — STC Ultimacc Components, Inc., a division of STC Systems, Inc., recently announced the acquisition of the Raleigh, N.C.-based Global Software, Inc. According to a spokeswoman for STC Ultimacc, the acquisition is valued at \$2 million in cash and \$10 million in notes.

The spokeswoman said the acquisition will enable the STC division to add health care turnkey systems to its line of turnkey systems already serving industries such as lumber, apparel, publications, warehousing and others. Software developed by Global will also enable the STC division to offer plug-compatible parity with IBM's Series/36, Series/38 and 4300, according to the spokeswoman.

Global will continue operations as an autonomous business unit with a continuation of its present management team of Ronald Kupferman, president, and Frederick Filger, who will report directly to George J. Pilmanis, president of STC Systems.

The spokeswoman said the acquisition will also enable STC Ultimacc to offer software with its systems at a much lower cost than was previously possible. Previously, the company had paid for third-party software.

The arrangement will provide STC Systems — which had 12 regional offices — with Global offices in Raleigh, Richmond, Va., and Los Angeles, in addition to a 12-member team of international agents.

STC Systems, a wholly owned subsidiary of Storage Technology Corp., is projecting combined revenues of \$25 million.

If you're looking for a personal computer that will satisfy your company's professionals and managers, IBM now has exactly what you need.

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The facts, many personal computers can be too personal for many business environments. Not the IBM 3270-PC. Its strength is the ease with which it communicates with IBM hosts and office systems — in the next room or around the globe.

The IBM 3270 Personal Computer is designed to accommodate the way people actually work. It can display in color up to seven windows of information at one time. Four with data from host computer applications (on the same or different hosts), two electronic notepads and one IBM Personal Computer session. And despite its impressive capabilities, the IBM 3270-PC is small enough to sit on a desk without taking it over.

The information windows can be moved, just as a person moves papers on a desk. They can be made bigger or smaller, put on top for immediate atten-

tion or temporarily hidden when not in use. Information on the screen can be processed, printed or exchanged between windows. And the IBM 3270-PC can be programmed by the data processing professional to meet the needs of each end user or department.

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## Adapso Releases Financial Survey

ARLINGTON, Va. — A financial survey of 150 U.S. companies providing various types of computer services was recently released by the Association of Data Processing Service Organizations, Inc. (Adapso).

Adapso's Operating Ratio Survey provides a variety of measures indicating how various entities "stack up against the competition," according to Jerome L. Dreyer, president of the association.

Survey participants are entitled to a report comparing their results to the survey data base. Information is available from Adapso, Suite 300, 1300 N. 17th St., Arlington, Va. 22209.

# IBM Seen Poised for Communications Assault

FRAMINGHAM, Mass. — IBM has emerged as a much more potent competitor than the antitrust-bound giant of the late 1970s and is in the process of becoming a very aggressive communications company, according to "IBM, The Giant Awakens," a report published by International Data Corp. (IDC).

With record sales of 3061 computers and 3380 disks, IBM's share of the 1992

*"IBM would much rather see its users buy products from others that can fit into an IBM network than have its customers build non-SNA networks to which IBM would provide products as just another vendor."*

— International Data Corp.

mainframe market reached 71%, its highest since the early 1970s, according to IDC. With results expected to be similar in 1993, IDC concludes that IBM appears to be

establishing a new level of high-end dominance.

Big Blue has adopted major philosophical and strategic shifts, the report claims. Historically, IBM has de-

fended its mainframe turf by keeping its 370 architecture proprietary, but has abandoned that approach with the Personal Computer, thus attracting the type of third-party software and peripheral support needed to meet the diverse needs of that market.

From the experience of the Personal Computer, IDC said, IBM has changed its thinking and become more

open to competitors wishing to support its System Network Architecture (SNA) and has published its Document Content and Document Interchange Architecture (DCA/DIA) specifications well in advance of their availability on many products.

"The strategy is clear," according to IDC. "IBM hopes that a combination of its 3270 protocol, SNA and its DCA/DIA formats will allow it to establish the de facto communications standards for the next decade. And as the plug-compatible market continues to grow, the 370 architecture also looms as a strong industry standard."

Control of communications standards is one way of bracing for the upcoming battle with AT&T and others for control of the giant integrated digital networks that will evolve over the next few years and become more important than hardware and peripherals, the report says. "Recognizing that it cannot meet all of its customers' needs, IBM would much rather see its users buy products from others that can fit into an IBM network than have its customers build non-SNA networks to which IBM would provide products as just another vendor," IDC concluded.

## More Aggressive Stand

IDC said IBM will become aggressive in the fast-growing, \$100 billion communications market that it previously has not tapped. And the computer giant has shifted from the goal of dominating a few markets to one of participating in the growth of many markets, as evidenced by the establishment of independent business units to enter fast-moving areas such as personal computers and robotics, according to the report.

IDC expects that IBM will now start to concentrate more heavily on mid-range systems to meet the competition from Digital Equipment Corp., Wang Laboratories, Inc. and others, the report said. "DCA/DIA appears to be the giant's way of tying [its variety of products] all together to meet its customers' office automation needs."

The 71-page report contains detailed analysis of IBM's hardware, software and financial strategies, as well as overviews of joint-venture efforts and office and communications positioning, with an emphasis on the implications for competitors. Priced at \$295, it is available from Department MT, International Data Corp., 3 Speen St., Box 935, Framingham, Mass. 01701.

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Forte products for the micro-mainframe link are totally self-loaded, and enhancements will be diskette-based. Such Forte upgrades as new terminal emulations and custom file transfers will be on diskette, so your investment today is protected. Right now, Forte products provide such delights as switch-selectable address selection, field-configurability of PC elements such as keyboard changes, program symbols, full-color graphics, menu-selected file transfers, and access of full-screen host applications. There's lots more, too, including parity and remote dial-up of the host via coax. All the reasons for a micro-mainframe connection for your business are compelling today. They'll be essential tomorrow. We can help you put your IBM Personal Computers on the Freeway to the Future now. Ask about it. That's our Forte.

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# DEC Announces VAX Software Marketing Pacts

MAYNARD, Mass. — Digital Equipment Corp. recently announced three cooperative marketing agreements for manufacturing- and process-related software that will be marketed with the VAX series of superminicomputers.

Agreements for DEC to promote and market software products were reached with Consilium Associates of Palo Alto, Calif.; NCA Corp.

of Sunnyvale, Calif.; and Rath & Strong System Products, Inc. (RSSP) of Dallas.

Consilium's Comprehensive On-Line Manufacturing and Engineering Tracking System is an 11-module computer-aided manufacturing software package that reportedly is used primarily in semiconductor manufacturing. Written in Ansi Cobol and utilizing standard VAX architecture and layered soft-

ware, the modules range in price from \$25,000 to \$150,000 and are available 30 days after receipt of order.

NCA Corp.'s Maxcim product is a 14-module package with an integrated common data base designed as a manufacturing and financial planning and control system to provide information required for planning, reporting and control of manufacturing resources; the system

integrates information from manufacturing, marketing, finance and engineering functions. Originally developed for the PDP-11 series, the VAX version can be configured on VAX-11/750, 11/780 and 11/782 systems. Prices range from \$60,000 up to the complete package cost of \$113,000, and delivery is 30 days after receipt of order.

The Production and Inventory Optimization Sys-

tem from RSSP is an eight-module closed-loop package reportedly providing master production scheduling, purchasing management, shop-floor control, inventory control, customer order entry, materials requirement planning, bill of materials and cost management. Written in Ansi Cobol, modules are priced from \$10,000 to \$25,000 individually, with versus for single-plant and multiple-plant operations available for \$100,000 and \$250,000 respectively.

More information is available from DEC, Maynard, Mass. 01754.

## Fujitsu Nets 21% Increase In Income

TOKYO — Fujitsu Ltd. recently reported net income of \$81.5 million for the six-month fiscal period ending Sept. 30, nearly a 21% increase over the corresponding period in 1982. Earnings were \$67.5 million.

Net sales for the six-month period rose 20% to \$1.9 billion, compared with \$1.56 billion in the same period the previous year.

Fujitsu reported a decline of 1.4% in sales of communications systems, but healthy increases of 20.5% for computers and DP equipment and 42.4% for electronic components. Export revenues increased 18.3%.

The Japanese company predicted that net sales for the fiscal year ending next March 31 will reach \$4 billion, and earnings will be \$186 million, compared with earnings reported for the fiscal year ended this past March of \$159 million on sales of \$3.42 billion.

## Comdex Set For Japan

NEEDHAM, Mass. — The Interface Group, Inc. has announced that its series of Computer Dealer Exposition (Comdex) conferences for the computer industry will extend to Asia with the premiere of "Comdex in Japan" in spring 1985.

The conference will be sponsored by the Interface Group and the Comdex in Japan Executive Committee, a joint venture partnership comprising two Asian firms — International Congress Service, Inc. and Information International, Inc.

More information is available from the Interface Group, 300 First Ave., Needham, Mass. 02194.

# WHICH TWIN HAS THE TANDBERG?

The big screen terminal that's soooooo easy on the eyes

If your operators are getting eye-strain and headaches from staring at small, fuzzy screens all day long, chances are, you haven't yet heard of the Tandberg Data TDV 2200.

The TDV 2200 features a 15-inch screen with big, flicker-free, green-on-green characters; a patented Equalizer™ Video system that displays both vertical and horizontal lines with equal intensity; and true character definition across the entire 15-inch screen. The TDV 2200 also tilts, swivels, raises and lowers for easy readability in any room light, at any angle.

But there's a lot more to the TDV 2200 than meets the eye. There are sixteen soft switches called PUSH keys that recall previously stored words, phrases, or code sequences. A single keystroke can recall up to 48

characters. This not only saves time, but also eliminates the possibility of error when entering this data. Up to 416 characters can be stored and recalled from the terminal or host computer.

There's also a simplified menu protocol that cuts set-up time in half; full editing capability; up to eight screens of memory; semi-graphic display; character, page, block or line/field transmission and a host of other features.

The Tandberg Data TDV 2200 family is available in a number of models that will emulate virtually any popular terminal including the DEC VT100 and VTS2, Data-point 3800 and 8200, IBM 3101,

## TANDBERG DATA

Tandberg Data, Inc.

Data General 6053 and D200, H-P 2622, Basic Four and others. An advanced performance model is also available for the development of application-tailored OEM terminals.

To truly appreciate this outstanding combination of graceful ergonomic design, functional capabilities and performance features, you should really try one for yourself. Just call or write for a demonstration. You'll see that there's a lot more to the TDV 2200 than meets the eye. Tandberg Data, Inc., P.O. Box 99, Labriola Court, Armonk, N.Y. 10504. Phone: (914) 273-6400. Telex: 137357 Tandberg Armk.

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Today, Wollongong software products not only operate under UNIX, but also under DEC's VMS and our proprietary EUNICE which provides a transparent link between UNIX and VMS on the same host computer.

#### **System-level packages**

These run under VMS or EUNICE for VAX users, or UNIX for PE 3200 users.

**IP/TCP** Internet Protocol Transmission Control Protocol is the newly adopted Department of Defense standard which provides a set of cooperative processes allowing two or more host computers to communicate.

**R/M COBOL** is a high-level implementation of the ANSI 74 COBOL standard, designed for efficient development and execution of COBOL business applications. Features include (and optional COBOL, Level-2 relative and indexed file organizations), plus full arithmetic capability.

**Peripherals** feature support for various and expanding, and

# Micros Seen Redefining Value-Added Mart

By Peter Bartelink  
CW Staff

FRAMINGHAM, Mass. — The rush of microprocessor-based hardware and software in commercial markets is redefining the boundaries of virtually all traditional computing markets and has critical implications for value-added suppliers, according to a report by International Data Corp. (IDC).

"Hardware Strategies of Value-Added Vendors," a 53-page report by IDC's Continuous Information Ser-

vices, concludes that the rationale for large system computer's monopoly in commercial markets is fading rapidly as computer processing and storage prices radically decline. The result, according to the study, is that value-added suppliers — providers of processing and professional services, independent software firms and OEM/system houses — face rapid changes in the traditional markets.

"New hardware technology and architecture are critically important in the breakthrough to significant

new end-user markets, but just as important is the software that makes the machines work the way users need them to," the report said.

Prior to the micro breakthrough, IDC said, "the software industry was a veritable Tower of Babel [with] many languages and syntaxes used by enclaves that could not communicate with each other — all to protect the hardware manufacturers' installed base from incursions by competitors."

Micro manufacturers, however,

have relied on a handful of operating systems, that have become de facto standards, resulting in a large number of applications packages "allowing users instant access to large libraries of software for their newly purchased micros," IDC said.

Timesharing services, both data base providers and time-sharing companies, increasingly see microcomputer offerings as important to their survival and "to prevent further erosion of their traditional business."

(Continued on Page 168)

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## Executive Corner

• **Richard P. Abraham** has been appointed president of Synetrix, Inc., a Honeywell, Inc. subsidiary.

• **Jerry Thorp** has been named president and chief operating officer of Solutions Group, Inc.

• **Paul J. Brooks** has joined Infodata Systems, Inc. as vice-president, marketing.

• **Andrew C. Knowles** has been named president and chief executive officer of Lexidata Corp., replacing Ralph T. Lindeblad, who will remain a member of the board of directors.

• **Donald L. Wolfe** has been appointed vice-president of finance and chief financial officer at Seagate Technology, Inc.

• **Anthony L. Craig** has been appointed vice-president, international sales integration, at General Electric Information Services Co.

• **Mornay R. Mahoney** has been appointed vice-president in charge of European operations for Storage Technology Corp.

• **Cal Shoemaker** has been named vice-president for sales and marketing at Timplex, Inc.

• **Ramam M. Patel** has been promoted to vice-president, channel products and special engineering, in Harris Corp.'s Interactive Products Division.

• **Charles M. Brennan III**, senior vice-president and chief financial officer at Gould, Inc., has been named a director of the company. Dr. Joseph E. Rowe has been elected vice-chairman and chief financial officer and Henry J. Peppers has been elected executive vice-president of defense systems, business section.

• **Richard E. Pigman** has joined Associates Bancorp, Inc. as senior vice-president of information technical services.

• **Charles F. Reilly** has been appointed senior vice-president of marketing, sales and service at Centronics Data Computer Corp.

• **Dean Willett III** has been appointed corporate treasurer at Amdahl Corp.

• **William J. Razouk** has been named vice-president, sales, and James R. Vaughan has been named vice-president, service, for Federal Express Corp.'s Electronic Products Division.

• **Ron G. Stegall** has been promoted to senior vice-president, computer marketing, at Tandy Corp.

• **Bert J. Nevak** has been elected an officer of Tymshare, Inc. and named group vice-president of computer management services.

• **Jim Ortman** has been promoted to senior vice-president of sales at Phillips

Information Systems, Inc.

• **David K. Anderson** has been promoted to vice-president and legal counsel for the computer systems operations of Sperry Corp.

• **Wallace A. Cataldo** has been promoted to chief financial officer for Keane, Inc.

• **George W. Sullivan** has been appointed president and Charles M.H. Shiu has been appointed vice-president, business development,

at Northern Telecom International, Inc.

• **Charles Babbitt** has been appointed executive vice-president and chief operating officer at Ashton-Tate.

• **Robert L. Dahlberg** has been named by Otron Computer Corp. of Boulder, Colo., as director of manufacturing. He was formerly director of material for Harris

Corp. in Dallas.

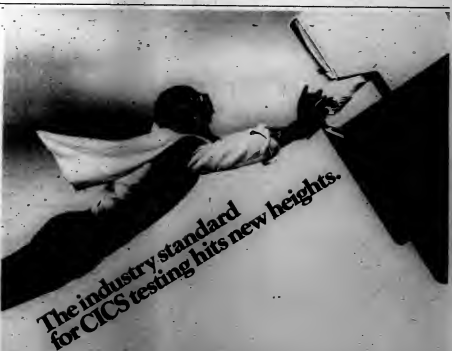
• **David J. Packwood** has been named president of Altego Products, Inc. Packwood was previously sales director for Software Sciences, which purchased Altego in April.

• **John J. Theiss** has been named president and general manager of Cardkey Systems, Inc., a Fairchild Industries, Inc. company.

• **David R. Earl** has

joined Fixel Computer, Inc. as vice-president of manufacturing, the same position he held for four years at Data Terminal Systems, Inc.

• **Walter J. Einsmann** has been appointed vice-president of Tymshare, Inc.'s national accounts division. A Tymshare vice-president for four years, he most recently served as general manager of the office automation division.



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CW080



# Micro Software Mart Competition Seen Intense

By Bohdan O. Szuprowicz  
Special to CW

Early last month, Lotus Development Corp. became the first of the new breed of micro software companies to go public. Its immediate performance in the aftermarket augurs well for a group of leading microcomputer software firms that are expected to go public in the months ahead. Lotus came to market with 2.6 million shares at \$18 each, which rose to over \$27 per share in recent trading.

The overall market for micro software is estimated at \$2.1 billion and expected to increase rapidly to almost \$12 billion by 1988. There appears to be much room for growth and profits for entrepreneurs and investors alike.

But these statistics may be deceptive because, unlike hardware manufacturing, just about anyone with a microcomputer can get into the micro software business; the competition in this game is probably more intense than in any other high-technology sector.

In mid-1983 there were at least 5,000 micro software products on the market, supplied by about 200 manufacturers. That, however, accounts for only the most visible and best financed suppliers. An executive at a recent meeting of the Association of Data Processing Service Organizations, Inc. (Adapso) said his company started a count of micro software firms in North America, giving up after reaching 11,000, with no end in sight.

## Few and Far Between

This means the average revenues of a micro software firm are but a few hundred thousand dollars per year; while the industry is booming, individual firms with prospects of rapid and profitable growth to become micro software giants are few and far between.

A recent Adapso study also revealed that average revenues per employee in a micro software firm are just over \$53,000, about half that of employees at mainframe and minicomputer software companies. At the same time, micro software firms spent almost 50% of their revenue on salaries and are constantly scrambling to find new talent as their employees move to better paying jobs with competitors or start their own micro software businesses.

A recent survey identified 25 software companies whose revenues grew by over 50% during 1982. Among those firms, there were eight companies growing at over 100%, and five of those were new micro soft-

ware firms such as Softset Computer Products, Inc.; Micropro International Corp.; Ashton-Tate; Digital Research, Inc.; and Microsoft, Inc.

Ashton-Tate specializes in cross-industry micro software, and its relational database management system is the third-best selling package after VisiCorp's Visicalc and Lotus 1-2-3, which gave Lotus its leading edge in this

market.

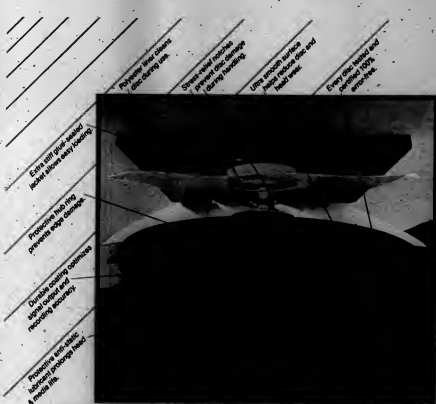
But the leader of the pack with an impressive growth in revenues of 353% during 1981-82 is Softset, the largest independent distributor of micro software packages, which expects to double its revenues to about \$70 million in 1983. The company also received at least \$11 million in venture capital and looks like a prime prospect for going public very soon.

Only extensive trialedelivery of software directly from producer to end user threatens its future.

Micropro turned up as the second-fastest growing micro software company, whose revenues rose by 336% from \$9 million in 1981 to over \$39 million in 1982 and are expected to reach \$50 million in fiscal 1983. Micropro produces the Wordstar word processing package.

Digital Research, owner of CP/M, posted revenue growth of almost 160%, to \$22 million in 1982, and the company expects to reach between \$30 million and \$40 million in fiscal 1983.

Microsoft, also competing in the operating micro software business, has been growing at about 120% per year recently and expects to double again to about \$50 million in fiscal 1983.



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**Software Sales Representative.** International manufacturer of CPA accounting software with 5500 representatives in all 50 states is expanding its Atlanta sales team. Position requires two years of

quite measured sales experience with small business computers and a general knowledge of financial business and financial applications. First year compensation to \$22,000.

**IMS Applications Analyst—IBM Regional.** Prestigious Atlanta financial services organization is seeking experienced DB/DC Analysts for a major regional project. Two years of IBM DB/DC experience and a strong background in IMS DB/DC are required. To \$22,000.

**Banking Programmer and Analysts.** One of Atlanta's largest financial institutions is seeking two experienced programmers and a programmer/analyst to develop and implement a major ATM project in an OS/VS1 environment. Two years of IBM DB/DC experience and a strong background in IMS DB/DC are required. To \$22,000.

**Communications Specialist—Super Systems.** Division of a world renowned manufacturer of aircraft is increasing its technical support staff to communications. Three years of IBM DB/DC experience and a strong background in IMS DB/DC are required. To \$22,000.

**Consultant—Partner Potential in National CPA Firm.** Firm with heavy concentration in IBM DB/DC and PL/I seeks a DFP Consultant to expand its Atlanta and Miami offices. Strong background in IBM DB/DC and PL/I, and a broad industry reference base support. Will gain a broad exposure to a variety of computer hardware applications. Career path to partner. To \$27,000.

**CICS Analyst—Move Into Development.** Well-known Atlanta-based service organization is transferring its Analyst staff to implement a major on-line database project. Two years of IBM DB/DC experience and a strong background in IMS DB/DC are required. To \$22,000.

**IBM Applications—Train for DBA.** Major software service firm is offering IBM DB/DC training for its IBM DB/DC Data Base Administrators. Will join two turnkey DBAs in a major regional data base environment. Two years of IBM DB/DC experience and a strong background in IMS DB/DC are required. To \$22,000.

**Manufacturing Systems Analyst.** South Carolina manufacturer of heavy equipment seeks an Analyst who can assist in the design and implementation of a new manufacturing system. Three years of manufacturing experience in IBM DB/DC and PL/I are required. To \$22,000.

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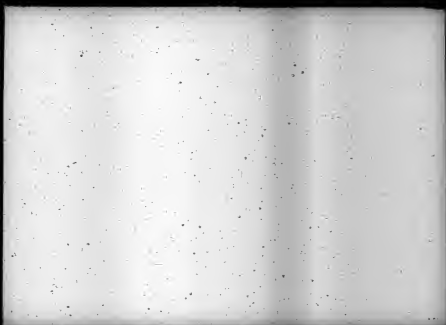
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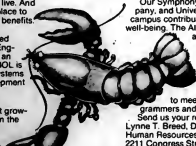
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### INTERNATIONAL TECHNICAL CONSULTANT

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**Qualifications:** Solid experience in IBM systems/applications software with emphasis in operating systems, database and teleprocessing.

**Positions involve** international travel including Japan, Australia and Europe.

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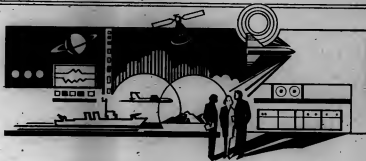
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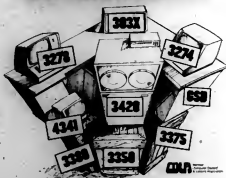
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# 15 pointed questions to ask MSA or any software supplier

These questions will help you when you sit down with individual software companies.

They're tough questions. Relevant ones. And any supplier who is worth his salt should be able to answer them without backpedaling.

## Ask MSA

We'll answer all these questions to your satisfaction—plus any others you may have.

In fact, we're probably the best equipped to answer them. Because MSA is the software company. We offer the most complete line of totally integrated systems in the software industry, including financial, human resource and manufacturing.

So you avoid the headache of trying to tie together individual systems. (And the even bigger headache of adding to them.)

With MSA's integrated systems, there's no unnecessary duplication of data or effort. Reporting is faster. All your company's information is more timely and accurate—and in the right form.

## Our technical edge comes from experience.

Saying ahead is easier for a company that's steeped in software technology. MSA has spent years developing, refining, testing and enhancing our systems.

This year alone, we'll invest \$25 million to make sure all our systems are technologically razor sharp. That gives us a decided advantage over flash-in-the-pan technology that may not have the bug-free logic of a more experienced system.

It also gives you a decided advantage over "custom" systems you have to update yourself.

MSA relieves you of that time-consuming burden. We update and enhance your software for a full year. Then we continue this service for a surprisingly low annual fee.

Maintenance includes keeping your system up-to-date technologically. Enhancing it with new features that make it work even harder for you. And making sure it reflects changes in accounting procedures and government regulations, including 401(k), TEFRA, and FAS52. (That eliminates a lot of tedious work you normally have to do.)

## Save this box. It can help you make an intelligent software decision.

**1. Can you offer us a complete range of software systems regulations to work together?**  
Or will we have to piece together a patchwork of systems?

**2. Are your systems just record keepers, or can they really help us make decisions?**  
Can we pull together information from any of our integrated systems? In exactly the form we want it?

**3. Can you provide business software for both mainframe and microcomputers?**  
Do you develop this software yourself or do you simply market it for another company?

**4. Are your systems truly online or so all of our information is current?**  
How many of your systems are online? How secure are they?

**5. Will my company have to be the one that discovers the bugs in your brand new system?**  
Just how long have your systems actually been used, and how have they been tested?

**6. Will you update your systems as technology advances and regulations change?**  
What are some of your most recent updates? Will you keep us current on regulatory changes?

**7. Do your systems really do everything you say they will?**  
Or will we have to change them or add to them to get the features we want?

**8. How long have you been in business?**  
What are your revenues? What is your growth record? Where will your company be five years from now?

**9. How many systems has your company installed?**  
How many of these were installed in the past six months? How many of your earlier customers are still using—and liking—your systems?

**10. Do your financial systems handle unlimited foreign currencies?**  
Do your financial systems use a common set of currency exchange rates?

**11. Can you link our executives' computers directly to the mainframe—so they can get their own information?**  
Is that software available right now?

**12. How will you make sure our own people thoroughly understand your system?**  
Do you have educational centers near us, or will we have to travel all the way across the country to find one? Will you be there to help during installation and after?

**13. How many of your people specialize in software for my industry?**  
How many accountants work for you? Human resource specialists? Manufacturing experts?

**14. Do built-in features that make them easier to use?**  
What happens if someone needs help figuring out a feature? Do you have online documentation that's easy to understand?

**15. As my business changes enough to change with it?**  
As my business changes enough to change with it? Or will we have to pay a lot to revamp it? Or even regenerate it?

## 35,000 days of training

At MSA, we make sure your people have a firm grasp of our systems. Last year alone, we conducted more than 35,000 student days of customer training for over 1,800 companies. At education centers all over the world, as well as at our headquarters.

From training sessions to cassettes to complete, easy-to-understand documentation, MSA provides the most extensive Customer Education Programs in the industry.

And MSA systems are just as friendly as our people. Our online HELP feature actually guides users through our systems, and EASYSCREEN™ lets them design their own screens without creating data processing nightmares.

If there's ever a question or problem with our systems, MSA customers are always close to service. Our Account Managers are knowledgeable, responsive, and backed by a complete team of industry specialists.

**The heart of our integrated systems**

It's MSA's General Ledger System. Combined with Accounts Payable/Purchase Order Control and our other systems, it gives your company complete control over your financial information.

Over 800 data processes

ing specialists, accountants, and financial experts work together to make MSA's financial systems the most advanced and most highly integrated in the industry.

## MSA has the answers

Whatever your size—whatever your business—MSA has a total software solution.

We'll provide the highest quality integrated online software.

We'll tie your business and manufacturing software systems together, using our exclusive Extended Closed Loop™ manufacturing system.

We'll provide business software for your microcomputers, through our Peachtree Software Company.

We'll even link your microcomputers to your company's mainframe—with

MSA's Executive Peachpak™ application software. A revolutionary concept that lets executives get the mainframe information they need through their personal computers.

## Talk to us

We'd like to send you more information on how MSA can help you plan for software. And on individual systems. Contact Robert Carpenter at (404) 239-2000.

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